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TM 10-5411-201-14
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TECHNICAL MANUAL

OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE FOR

SHELTER, TACTICAL, EXPANDABLE, ONE-SIDED

(NSN 5411-01-124-1377)

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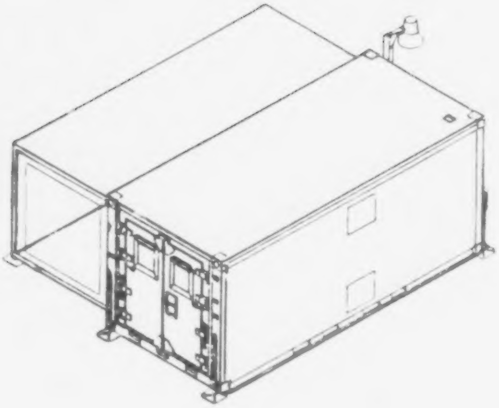

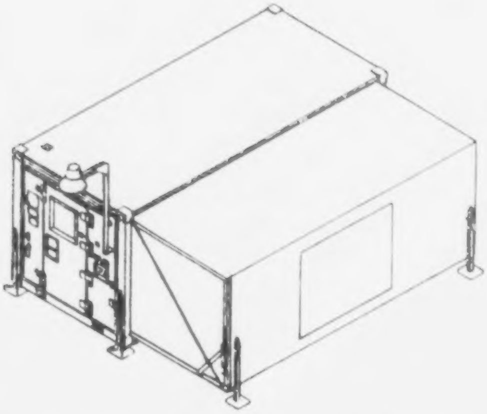

HEADQUARTERS, DEPARTMENT OF THE ARMY
1 APRIL 1986

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WARNING

HIGH VOLTAGE

exists in the electrical system of this equipment

DEATH ON CONTACT

may result if personnel fail to observe safety precautions

Before performing continuity checks or replacing electrical components, make sure that electrical power is completely disconnected from the circuit involved.

In the event of fluorescent lamp breakage, care must be taken in the removal of broken glass fragments and white phosphorous dust. Inhalation of phosphorous dust could cause dangerous injury.

Do not use handling equipment with capacity of less than gross weight of shelter system. Do not allow shelter to swing back and forth when it is suspended. Failure to observe this warning may result in damage to equipment or severe injury or death to personnel.

Methylethylketone (MEK) is flammable and toxic and must be used only in a well-ventilated area away from all sparks or open flame. Gloves should be worn during use.

Lock stop plate on load balancer with quick release pin before disconnecting support cable from hinged floor.

In extreme cold, do not touch metal parts with bare hands. Severe skin damage may result.

Safety glasses must be worn by personnel when installing ground anchors.

Expandable section (hinged floor and hinged sidewall together) weighs 700 pounds (318 kg). Do not stand directly in front of hinged section.

Support cables attached to hinged floor must be locked out prior to removal/installation of hinged sidewall.

Prior to removing load balancer from fixed roof, the hinged floor must be near stowed position to remove tension from support cable. The support cable bracket on hinged floor must then be removed to permit disconnecting support cable from hinged floor. Secure hinged floor to prevent accidental release.

Do not attempt to disassemble or repair load balancer. This equipment contains powerful torsion springs and serious injury or death to personnel could result if disassembled.

TECHNICAL MANUAL

NO. 10-5411-201-14

HEADQUARTERS, DEPARTMENTS OF
THE ARMY AND AIR FORCE
WASHINGTON, D.C., 1 April 1986

Operator, Organizational, Direct Support and General Support Maintenance

SHELTER, TACTICAL, EXPANDABLE, ONE-SIDED
(NSN 5411-01-124-1377)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Reports shall be submitted as follows: A reply will be furnished to you.

(A) Army - DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, U.S. Army Troop Support Command, ATTN: AMSTR-MCTS, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798.

(F) Air Force - AFTO Form -2 directly to: Commander, Sacramento Air Logistics Center, ATTN: MMST, McClellan Air Force Base, CA 95652 in accordance with TO-00-5-1.

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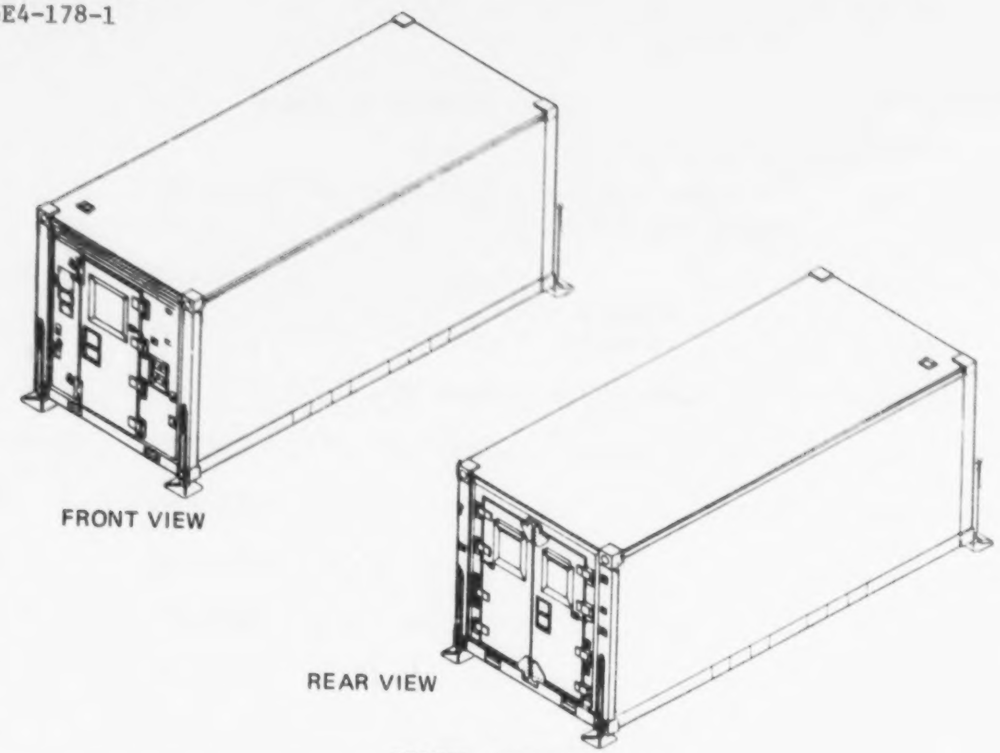
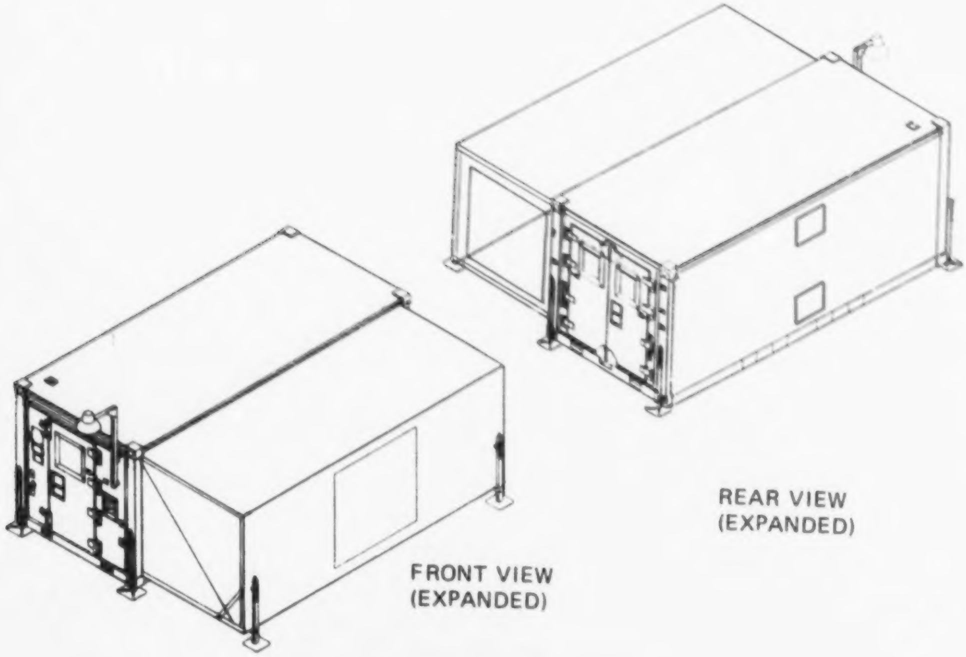

FRONT VIEW
REAR VIEW

STOWED SHELTER


REAR VIEW (EXPANDED)
FRONT VIEW (EXPANDED)

EXPANDED SHELTER

Full External View of One-Sided Expandable Tactical Shelter

CHAPTER 1

INTRODUCTION

Section I. GENERAL INFORMATION

1-1. SCOPE. This manual is for use by personnel responsible for operation and maintenance of the one-sided expandable tactical shelter assembly, which will be referred to as the shelter. It provides the user with necessary instructions to use the shelter and to perform required maintenance in accordance with the Maintenance Allocation Chart in Appendix B.

NOTE

Some portions of this publication are not applicable to all services. These portions are prefixed to indicate the services to which they pertain (A) for Army, and (F) for Air Force. Portions not prefixed are applicable to all services.

1-2. MAINTENANCE FORMS, RECORDS, AND REPORTS. Maintenance forms, records, and reports used by:

a. (A) Are prescribed by DA PAM 738-750, the Army Maintenance Management System (TAMMS).

b. (F) Are prescribed in AFM-66-1 and the applicable 00-20 Series Technical Orders.

c. (A) Users shall refer to the Maintenance Allocation Chart (MAC) for task and levels of maintenance to be performed.

d. (F) Users shall accomplish maintenance at the user level consistent with their capability in accordance with policies established in AFM 66-1.

1-3. (A) DESTRUCTION OF MATERIEL TO PREVENT ENEMY USE. For destruction procedures for materiel refer to TM 750-244-3.

1-4. ADMINISTRATIVE STORAGE. For procedures and inspections required during administrative storage, refer to Chapter 4, paragraph 4-45.

1-5. (A) REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR'S). If your shelter needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Tell us why a procedure is hard to perform. Put it on an SF 368 (Quality Deficiency Report). Mail it to: Commander, U.S. Army Troop Support Command ATTN: AMSTR-QX, 4300 Goodfellow Boulevard, St. Louis, Missouri 63120-1798. We'll send you a reply.

1-6. LIST OF ABBREVIATIONS.

AC	Air Conditioner
cm	centimeter
ECU	Environmental Control Unit
EIR	Equipment Improvement Recommendation
ft	foot (feet)
Hz	Hertz
in.	inch
ISO	International Organization for Standardization
kg	Kilogram
lb	pound
lg	long
MAC	Maintenance Allocation Chart
MEK	Methylethylketone (Solvent)
mm	millimeter
MTOE	Modified Table of Organization and Equipment
No.	number
PMCS	Preventive Maintenance Checks and Services
ref	reference
sq	square
TMDE	Test, Measurement and Diagnostic Equipment
Vac	Volts, alternating current

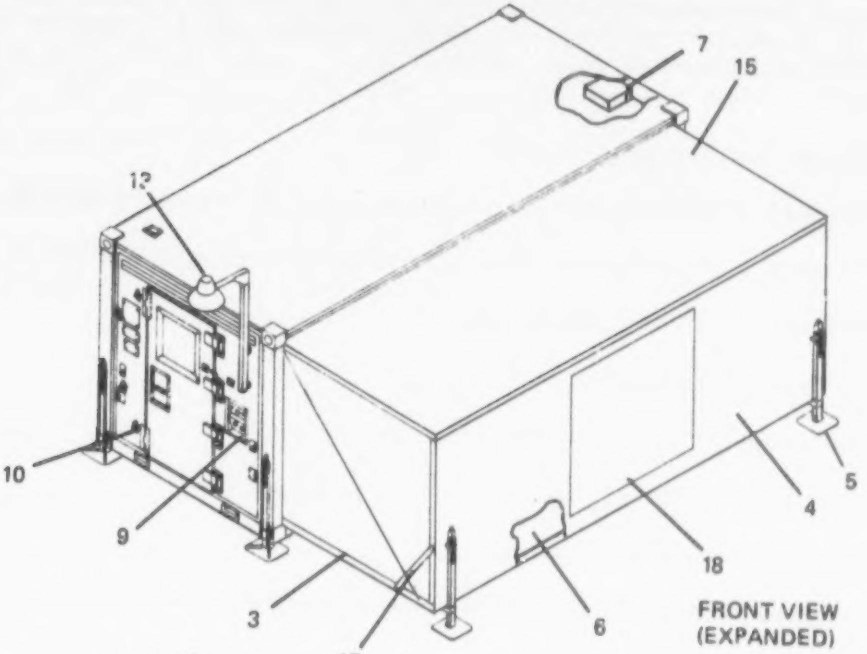
Section II. EQUIPMENT DESCRIPTION AND DATA

1-7. PURPOSE OF ONE-SIDED EXPANDABLE TACTICAL SHELTER ASSEMBLY. A self-contained transportable multi-application utility shelter. A member of family of standard rigid wall ISO shelters to be used by branches of the Department of Defense.

Capabilities and Features:

- Equipped with standard ISO fittings for easy transportability.
- Provided with mobilizer fittings for mobilizer transportation.
- Built-in fork lift provisions.
- All weather operation.
- Environmentally controlled interior.
- Rigid wall construction.
- Simple and fast deployment.
- Designed to operate under blackout conditions with door activated blackout switch.
- External electrical power connection.
- Easy to maintain.

1-8. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS.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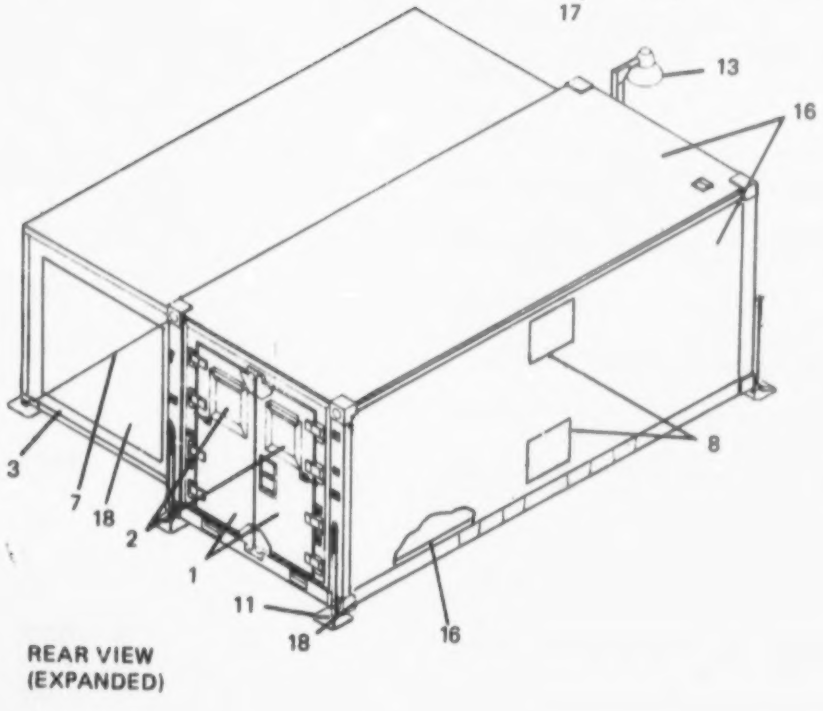
FRONT VIEW
(EXPANDED)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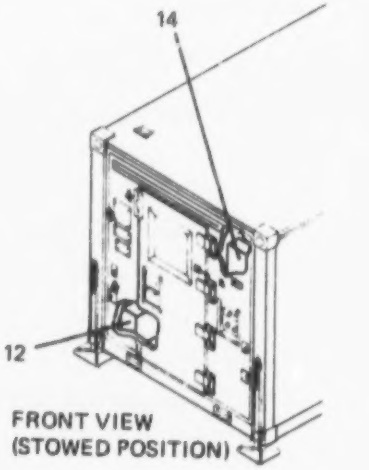
REAR VIEW
(EXPANDED)



FRONT VIEW
(STOWED POSITION)

1-8. (cont)

1. LEFT AND RIGHT CARGO DOORS. Provides access to shelter for delivery of bulky materiel and equipment.

2. DOOR VENTS. Manually operated vents provide ventilation and pressure equalization for the shelter.

3. HINGED ENDWALLS. Hinged to center structure and swing out to form walls in the expandable section of shelter.

4. HINGED SIDEWALL. Hinged to hinged floor panel. Forms a wall in the expandable section when shelter is expanded.

5. LEVELING JACKS. Secured to hinged floor and hinged sidewall. Provides leveling means for the expandable section.

6. HINGED FLOOR PANEL. Hinged to fixed floor panel. Provides additional floor space when shelter is expanded.

7. EXPANDABLE SIDE LOAD BALANCER. Consists of cable reels, cable guides, and support cable to assist in expanding and closing of hinged floor panel and hinged sidewall.

8. ECU PANELS. Provides for connections of ECU equipment used with shelter.

9. POWER ENTRY PANEL. A service entrance connector on this panel receives external primary input power for shelter and routes it to a circuit breaker panel inside the shelter. Includes provisions for optional shelter grounding and telephone connections.

10. FIXED PERSONNEL DOOR. Provides access to shelter. The only door used during blackout conditions.

11. CONTAINER LIFT JACKS. Provides leveling means for fixed section of shelter by means of ISO fittings.

12. EQUIPMENT CONTAINER CHEST. Contains leveling jack extensions, storm configuration (shelter tie-down) kit, area light incandescent bulb, removable latches, support braces, and screwdriver.

13. AREA LIGHT. Attaches to either personnel or cargo endwall panels to provide illumination at either end of shelter. Plugs into receptacle on power entry panel.

14. CIRCUIT BREAKER PANEL. Provides overload protection for shelter circuits. Main circuit breaker switches off all electrical power to shelter.

15. HINGED ROOF PANEL. Hinged to center structure roof. Swings up to provide roof for expandable section of the shelter.

1-8. (cont)

16. FIXED PANELS. Consists of personnel and cargo end, fixed floor, fixed sidewall and fixed roof panels. Used for equipment storage during transportation. All hinged panels are hinged to fixed container.

17. SUPPORT BRACES. Provides support to hinged sidewall during expanding procedures only.

18. CLOSEOUT PANELS. Used to cover openings in endwalls and sidewalls.

1-9. EQUIPMENT DATA.

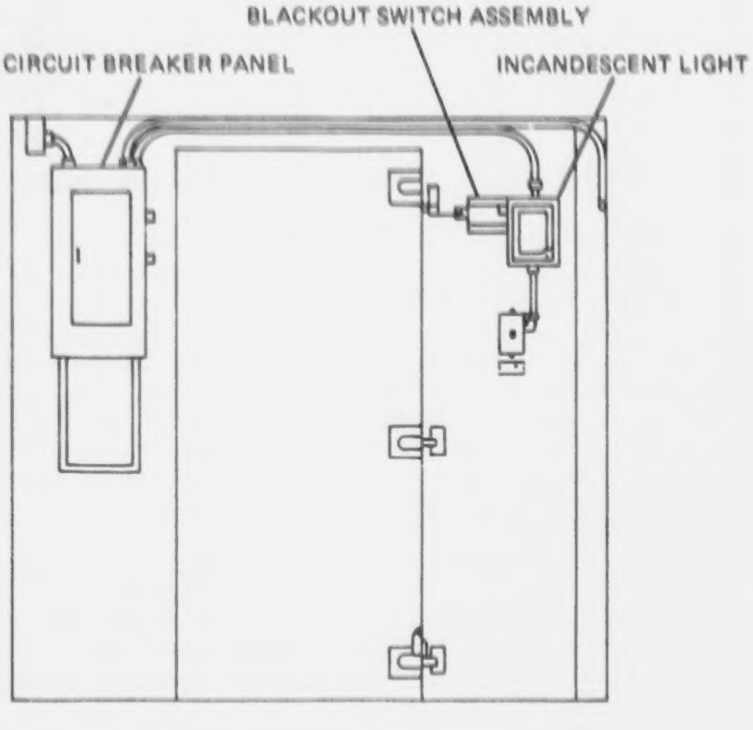
Exterior Dimensions (Stowed Shelter)	
Width	8 ft. (2.44 meters)
Height	8 ft. (2.44 meters)
Length	19 ft., 10-1/2 in. (6.05 meters)
Exterior Dimensions (Expanded Shelter)	
Width	14 ft., 10 in. (4.52 meters)
Height	8 ft. (2.44 meters)
Length	19 ft., 10-1/2 in. (6.05 meters)
Interior Dimensions	
Minimum clear height	80.29 in. (2.04 meters)
Minimum clear width (stowed mode)	77.78 in. (1.98 meters)
Usable floor space	271.75 sq. ft. (25.25 sq. meters)
Total Weights	
Less payload	5,300 lbs. (2409 kg)
With payload (maximum)	15,000 lbs. (6804 kg)
Primary Power Requirements	120/208 Vac, 60 Hz, 3 phase, 5 wire
Environmental Limits	
Operating temperature	-65°F to +125°F (-53.9°C to 51.7°C)
Transportability (Stowed Shelter)	
ISO fittings	Provided with upper and lower ISO fittings in accordance with specification ISO 1496/1.
Dolly Set	Equipped with mobilizer fittings for transportation with mobilizer. Model No. M832- 10,000 pounds (4546 Kg) maximum capacity (TM 9-2330-275-14&P). Model No. M1022 15,000 pounds (6804 Kg) maximum capacity (TM 9-2330-379-14&P).
Fork Lift	Built-in fork lift provisions.

CHAPTER 2

OPERATING INSTRUCTIONS

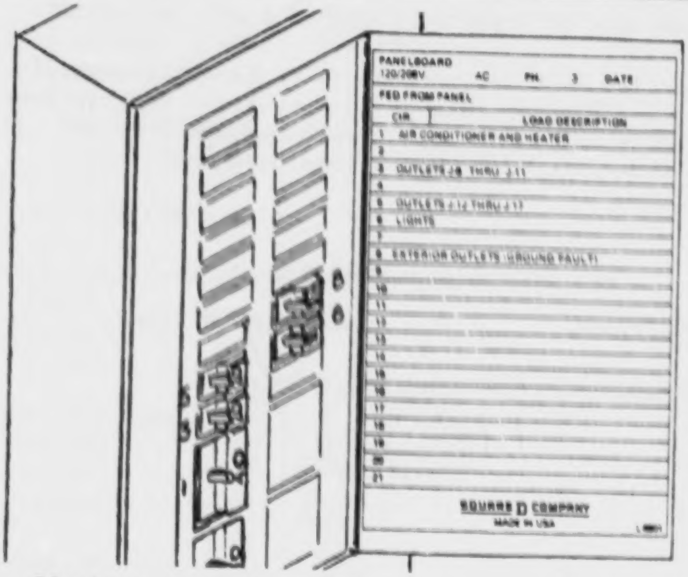
Section I. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS

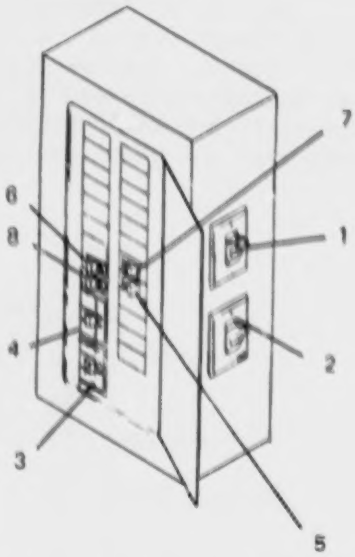
2-1. SCOPE. This section provides description and use of operator controls and indicators needed to operate shelter. This section provides descriptions for circuit breaker panel controls and indicators (See paragraph 2-2) and personnel end panel mounted controls and indicators (See paragraph 2-3).


BLACKOUT SWITCH ASSEMBLY
CIRCUIT BREAKER PANEL
INCANDESCENT LIGHT

INSIDE VIEW - LOOKING AT PERSONNEL END PANEL

2-2. CIRCUIT BREAKER PANEL CONTROLS AND INDICATORS


PANELBOARD
120/208V AC PH 3 DATE
FED FROM PANEL
CIR
LOAD DESCRIPTION
1 AIR CONDITIONER AND HEATER
3 OUTLETS J-8 THRU J-11
5 OUTLETS J-12 THRU J-17
6 LIGHTS
8 EXTERIOR OUTLETS (GROUND FAULT)
SQUARE D COMPANY
MADE IN USA



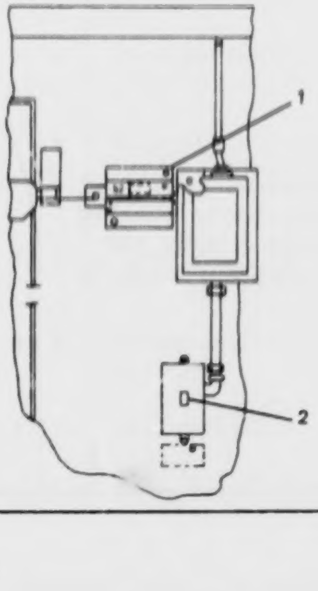
Control or Indicator	Function
1 Blackout override switch	In ON position, overrides door activated blackout switch mounted on personnel end panel adjacent to personnel door. During blackout conditions, must be in OFF position. Circuit protected against overload by circuit breaker.
2 Incandescent light switch	In ON position, turns on wall mounted incandescent light. In OFF position, turns off wall mounted incandescent light. Circuit protected against overload by circuit breaker.
3 Main circuit breaker	In ON position, delivers electrical power to individual circuit breakers. In OFF position, turns off all electrical power in shelter.
4 Circuit breaker	Provides overload protection for heater/ac supply receptacle mounted on power entry panel.
5 Circuit breaker	Provides overload protection for incandescent light, blackout circuit mounted on fixed personnel endwall and all flourescent lights in shelter.

2-2. (cont)

Control or Indicator	Function
6 Circuit breaker	Provides overload protection for interior utility outlets mounted on fixed sidewall.
7 Circuit breaker	Provides overload protection for ground fault interrupter utility outlet mounted on power entry panel.
8 Circuit breaker	Provides overload protection for interior utility outlets mounted on hinged sidewall and hinged endwalls.

2-3. PERSONNEL END PANEL MOUNTED CONTROLS AND INDICATORS

Control or Indicator	Function
1 Door activated blackout switch	During blackout conditions it turns off all lights in shelter when fixed end personnel door is opened. To override operation of this switch, the circuit breaker panel mounted blackout override switch must be in ON position. Circuit protected against overload by circuit breaker.
2 Ceiling lights switch	In ON position, turns on six fluorescent lights in shelter. In OFF position turns off all fluorescent lights. Circuit protected against overload by circuit breaker.



Section II OPERATOR'S PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

2-4. GENERAL. For the shelter to be ready for use at all times, it must be inspected systematically so that defects may be discovered and corrected before they result in serious damage or failure.

a. Before you operate. Always keep in mind the CAUTIONS and WARNINGS. Perform your "B-before" PMCS (Table 2-1).

b. While you operate. Always keep in mind the CAUTIONS and WARNINGS. Perform your "D-during" PMCS (Table 2-1).

c. Monthly. Always keep in mind the CAUTIONS and WARNINGS. Perform your "M-monthly" PMCS (Table 2-1).

d. If your equipment fails to operate, troubleshoot with proper equipment. Report deficiencies as follows:

(1) (A) Users report in accordance with DA PAM 738-750.

(2) (F) Users refer to applicable inspection manuals and work card sets in the TO 35C2-3 series for periodic requirements and the PMCS Table for detailed procedures.

2-5. SPECIAL INSTRUCTIONS. The following actions apply while performing your PMCS:

a. Stop operation immediately if deficiency is noted during operation which would damage the equipment.

b. Defects discovered during operation of the equipment should be noted for future correction to be made as soon as operation has ceased.

2-6. PREVENTIVE MAINTENANCE CHECKS AND SERVICES TABLE. Table 2-1 lists all PMCS to be performed by the operator.

NOTE

> If the equipment must be kept in continuous operation, check and service only those items that can be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down. Inspect shelter for leaks.

Table 2-1. Operator's Preventive Maintenance Checks and Services

B - Before D - During M - Monthly

Item No.	Interval B	Interval D	Interval M	Item to be Inspected	Procedures Check for and have repaired or adjusted as necessary	For Readiness reporting, equipment is Not Ready/ Available if:
ELECTRICAL SYSTEM						
1	●	●	●	Circuit breaker panel assembly	Inspect for damage to door and panel	Circuit panel damaged
2	●	●	●	Panel wiring	Inspect for damage or disconnection	Wiring damaged or disconnected
3	●	●	●	Light switches	Inspect for operation	Lights not operating
4	●	●	●	Circuit breakers	Inspect for operation, condition, and security	Circuit breakers not operating
5	●	●	●	Power entry panel assembly	Inspect for damage to panel	Panel damaged
6	●	●	●	Receptacles	Inspect for operation, condition, and security	Receptacles not operating
7	●	●	●	Terminals/ Connectors	Inspect for operation, condition, and security	Terminals/connectors not operating
8	●	●	●	Area light assembly	Inspect for operation	Light not operating
9	●	●	●	Incandescent light assembly	Inspect for operation	Light not operating
10	●	●	●	Hinged roof area ceiling lights	Inspect for operation	Lights not operating
11	●	●	●	Fixed roof area ceiling lights	Inspect for operation	Lights not operating
12	●	●	●	Receptacle outlets	Inspect for operation	Outlets not operating
13	●	●	●	Wall switches	Inspect for operation	Switches not operating

Table 2-1. Operator's Preventive Maintenance Checks and Services (cont)

B - Before D - During M - Monthly

Item No.	Interval			Item to be Inspected	Procedures Check for and have repaired or adjusted as necessary	For Readiness reporting, equipment is Not Ready/Available if:
	B	D	M			
14	●	●	●	Blackout switch	Inspect for operation	Switch not operating
15	●	●	●	Wiring	Inspect for damage or disconnection	Wiring damaged or disconnected
DOOR ASSEMBLIES						
16	●		●	Personnel and right cargo door	Inspect for operation, condition and security	Door not operating, damaged, or insecure
17	●		●	Door vent	Inspect for operation and condition	Vent not operating or damaged
18	●		●	Door lock assembly	Inspect for operation and condition	Lock assembly not operating or damaged
19	●		●	Door stop assembly	Inspect for operation and condition	Stop assembly not operating or damaged
20	●		●	Left cargo door	Inspect for operation condition, and security	Door not operating, damaged, or insecure
21	●		●	Foot bolt assembly	Inspect for operation and condition	Foot bolt assembly not operating or damaged
22	●		●	Chain bolt assembly	Inspect for operation and condition	Chain bolt assembly not operating or damaged

Table 2-1. Operator's Preventive Maintenance Checks and Services (cont)

B - Before D - During M - Monthly

Item No.	Interval			Item to be Inspected	Procedures Check for and have repaired or adjusted as necessary	For Readiness reporting, equipment is Not Ready/ Available if:
	B	D	M			
HINGED PANEL LEVELING JACK ASSEMBLIES						
23		●	●	Hinged panel leveling jack assemblies	a. Inspect for sinking into ground if shelter not level (check frequently during rainy conditions). b. Inspect for condition and security	a. Shelter not level b. Jacks damaged or insecure
HINGED PANEL ASSEMBLIES						
24	●		●	Hinged roof panel	Inspect skin surface for paint damage, corrosion, cracks, or punctures	Panel skin corroded, cracked, or punctured
25	●		●	Support strut assemblies	Inspect for operation and condition	Support strut assemblies not operating or damaged
26	●		●	Hinged endwall	Inspect skin surface for paint damage, corrosion, cracks, or punctures	Panel skin corroded, cracked, or punctured
27	●		●	Endwall closeout panel	Inspect skin surface for paint damage, corrosion, cracks, or punctures	Panel skin corroded, cracked, or punctured
28	●		●	Latches	Inspect for operation and condition	Latches not operating or damaged
29	●		●	Hinged sidewall	Inspect skin surface for paint damage, corrosion, cracks, or punctures	Panel skin corroded, cracked, or punctured
30	●		●	Sidewall closeout panels	Inspect skin surface for paint damage, corrosion, cracks, or punctures	Panel skin corroded, cracked, or punctured

Table 2-1. Operator's Preventive Maintenance Checks and Services (cont)

B - Before D - During M - Monthly

Item No.	Interval			Item to be Inspected	Procedures Check for and have repaired or adjusted as necessary	For Readiness reporting, equipment is Not Ready/ Available if:
	B	D	M			
31	•		•	ECU intake panel	Inspect skin surface for paint damage, corrosion, cracks, or punctures	Panel skin corroded, cracked, or punctured
32	•		•	ECU return panel	Inspect skin surface for paint damage, corrosion, cracks, or punctures	Panel skin corroded, cracked, or punctured
33	•		•	Hinged floor panel	Inspect skin surface for paint damage, corrosion, cracks, or punctures	Panel skin corroded, cracked, or punctured
CONTAINER LIFT JACK ASSEMBLIES						
34	•	•	•	Container lift jack assemblies	a. Inspect for sinking into ground if shelter not level (check frequently during rainy conditions). b. Inspect for condition and security	a. Shelter not level b. Jacks damaged or insecure
FIXED PANEL ASSEMBLIES						
35	•		•	Personnel door end endwall panel	a. Inspect skin surface for paint damage, corrosion, cracks, or punctures b. Inspect security of upper mobilizer fitting	a. Panel skin corroded, cracked, or punctured b. Upper mobilizer fitting insecure
36	•		•	Level assembly	Inspect for condition and security	Level assembly damaged or insecure
37	•		•	Folding step	Inspect for condition and security	Folding step damaged or insecure

Table 2-1. Operator's Preventive Maintenance Checks and Services (cont)

B - Before D - During M - Monthly

Item No.	Interval			Item to be Inspected	Procedures Check for and have repaired or adjusted as necessary	For Readiness reporting, equipment is Not Ready/ Available if:
	B	D	M			
38	●		●	Cargo door end endwall panel	a. Inspect skin surface for paint damage, corrosion, cracks, or punctures b. Inspect security of upper mobilizer fittings	a. Panel skin corroded, cracked, or punctured b. Upper mobilizer fittings insecure
39	●		●	Sidewall panel	Inspect skin surface for paint damage, corrosion, cracks, or punctures	Panel skin corroded, cracked, or punctured
40	●		●	Roof panel	a. Inspect skin surface for paint damage, corrosion, cracks, or punctures b. Inspect roof hand hold for condition and security	a. Panel skin corroded, cracked, or punctured b. Hand hold damaged or insecure
41	●		●	Load balancer and cable assembly	Inspect for operation, condition, and security	Load balancer and cable assembly not operating, damaged, or insecure
42	●		●	Stowage brackets	Inspect for condition and security	Stowage brackets damaged or insecure
43	●		●	Solar bar assembly	Inspect for operation, condition, and security	Solar bar assembly not operating, damaged or insecure
44	●		●	Floor panel	Inspect skin surface for paint damage, corrosion, cracks, or punctures	Panel skin corroded, cracked, or punctured

Table 2-1. Operator's Preventive Maintenance Checks and Services (cont)

B - Before D - During M - Monthly

Item No.	Interval			Item to be Inspected	Procedures Check for and have repaired or adjusted as necessary	For Readiness reporting, equipment is Not Ready/ Available if:
	B	D	M			
FRAME ASSEMBLY						
45	●		●	Corner post and ISO fitting assembly	Inspect for condition and security	Corner post or ISO fitting damaged or insecure
46	●		●	Camlock and latch cam handle	Inspect for operation, condition, and security	Camlock or latch cam handle not operating, damaged, or insecure
MISCELLANEOUS COMPONENTS						
47	●		●	Equipment container	Inspect for condition and completeness	Equipment container damaged or incomplete
48	●		●	Storm configuration components	Inspect for condition and completeness	Storm configuration components damaged or incomplete
49	●		●	Support braces	Inspect for condition	Support braces damaged
50	●		●	Leveling jack extensions	Inspect for condition	Leveling jack extensions damaged

CAUTION

Skin surfaces that are punctured/damaged will allow water entry into honeycomb panel. All punctures/holes of damaged areas must be covered immediately pending permanent repair.

Section III. SETUP OF SHELTER

2-7. PREPARATION FOR USE.

Select a site that:

- Has reasonable maneuvering area for vehicles that will be used for hauling or hoisting shelter.
- The terrain is firm, well drained, and relatively free of surface rocks or stones.
- The slope of the terrain does not exceed 18 inches (45.7 cm) over the projected floor area of the expanded shelter.

2-8. SHELTER INVENTORY CHECKS.

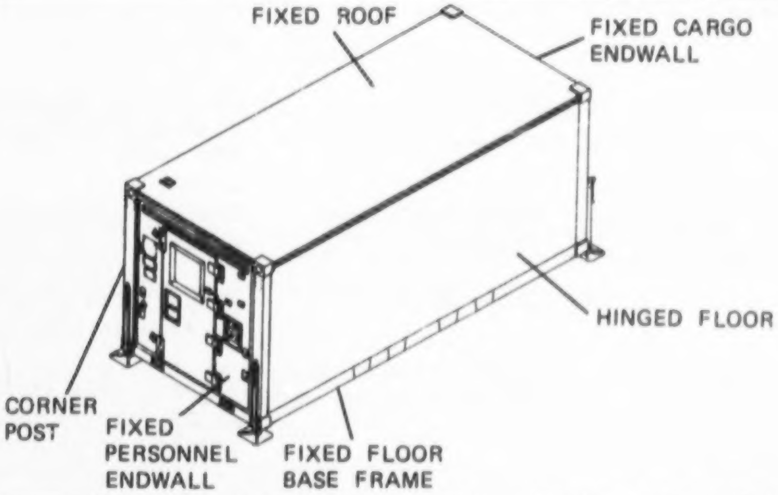
a. Expandable shelters are shipped uncrated.

b. Inspect shelter for damage incurred during shipment. If shelter has been damaged, report damage on DD Form 6, Packaging Improvement Report.

c. Check equipment against packing list to see if shipment is complete. Report all discrepancies in accordance with instructions of DA PAM 738-750.

d. Inspect shelter (stowed mode) in accordance with paragraph 2-9.

2-9. SHELTER INSPECTION CHECKLIST



LOCATION	ITEM	ACTION
1. Fixed personnel endwall	a. Power entry panel	Inspect connectors for damage.
	b. Identification and instruction plates	Check for legibility or missing plates.

2-9. (cont)

LOCATION	ITEM	ACTION
	c. Personnel door	Check for security and condition of door, locks, seals, and vent.
	d. Upper mobilizer fittings	Check for security and condition.
	e. Folding steps	Check for security and condition
	f. Components	Inspect for missing, bent, or damaged components.
	g. Skin	Inspect skin surface for paint damage, corrosion, cracks, or punctures.
2. Fixed roof	a. Roof handhold	Check for security and operation.
	b. Upper ISO fittings	Inspect fittings for damage.
	c. Skin	Inspect skin surface for paint damage, corrosion, cracks, or punctures.
3. Fixed cargo endwall	a. CSC Plate	Check for legibility or missing plate.
	b. Doors	Check for security and condition of doors, locks, seals, and vents.
	c. Upper mobilizer fittings	Check for security and condition.
	d. Components	Inspect for missing, bent, or damaged components.
	e. Skin	Inspect skin surface for paint damage, corrosion, cracks, or punctures.
4. Hinged floor	Skin	Inspect skin surface for paint damage, corrosion, cracks, or punctures.

2-9. (cont)

	LOCATION		ITEM	ACTION
5.	Fixed floor base frame	a.	Lower mobilizer fittings	Check for security and condition.
		b.	Lower ISO fittings	Inspect fittings for damage.
		c.	Frame edge and fork lift opening	Inspect for damage.
6.	Corner posts		Components	Inspect for missing, bent, or damaged components.

2-10. SHELTER HANDLING

WARNING

Do not use handling equipment with capacity of less than gross weight of system. Do not allow shelter to swing back and forth when suspended. Failure to observe this WARNING may result in damage to equipment or severe injury or death to personnel.

NOTE

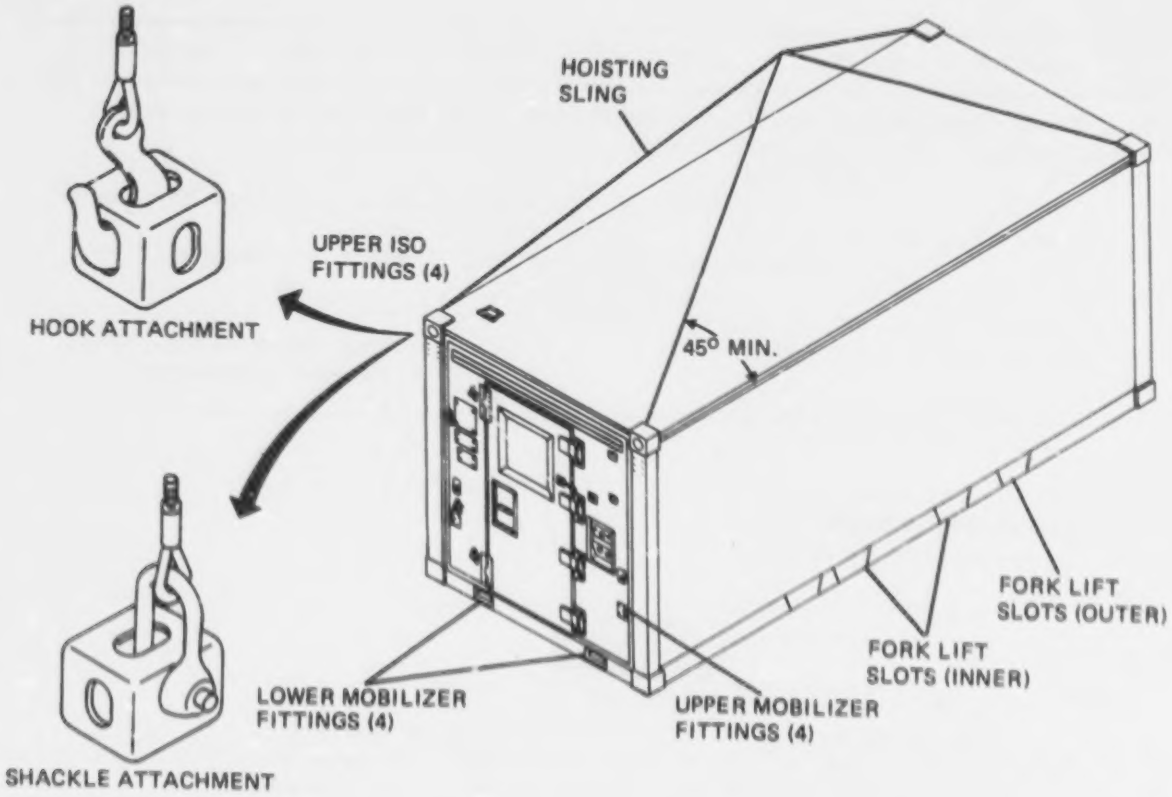
Dollyset M832 mobilizer used only if gross weight of shelter system is 10,000 pounds (4546 Kg) or less.

Dollyset XM1022 or hoisting sling (with cable breaking strength of 35,000 pounds) used if gross weight of shelter system is over 10,000 pounds (4546 kg).

When using fork lift, make sure it has a minimum tine length of six feet. Use inner slots for fork lifting an empty shelter only.

Use 20-foot container lift sling (bottom lift, type II, with a 20 long ton safe working load) with aluminum spreader, Appendix D.

2-10. (cont)


HOISTING SLING
UPPER ISO FITTINGS (4)
HOOK ATTACHMENT
45° MIN.
FORK LIFT SLOTS (OUTER)
FORK LIFT SLOTS (INNER)
LOWER MOBILIZER FITTINGS (4)
UPPER MOBILIZER FITTINGS (4)
SHACKLE ATTACHMENT

a. Hoisting from upper ISO fittings.

CAUTION

Do not attach hoisting sling or ISO lifting device to handling equipment in such a manner that angle between any hoist line and shelter is less than 45 degrees. Any angle less than 45 degrees will cause an excessive strain which could damage shelter.

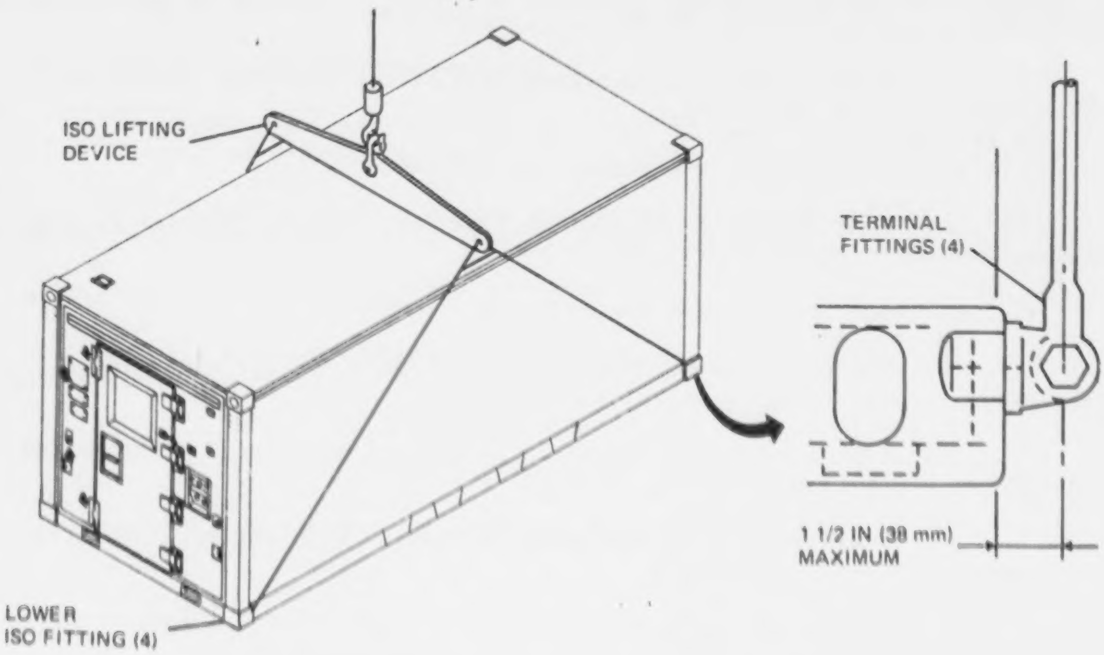
(1) Attach hoisting sling to crane or equivalent and four upper ISO fittings.

(2) Hoist shelter and position to desired location.

b. Hoisting from lower ISO fittings.

(1) Attach ISO lifting device to crane or equivalent and four lower ISO fittings.

2-10. (cont)



(2) The ISO lifting device should contact four lower ISO fittings only and not make any other contact with shelter.

(3) Terminal fittings shall be installed so that lifting forces are exerted not more than 1-1/2 in. (38 mm) away from ISO fittings.

(4) Hoist shelter and position to desired location.

c. Fork lifting from fork lift slots in base frame.

(1) Fork lift arms shall be at least 6 ft (1.8 m) long.

(2) Use care when inserting fork lift arms in fork lift slots.

(3) Use inner slots for fork lifting an empty shelter only.

(4) Use outer slots for fork lifting shelter with maximum payload.

d. Dollyset lifting from mobilizer fittings.

(1) Separate Dollyset sections and prepare for use observing all recommendations of Dollyset technical manual.

(2) Position Dollyset sections at ends of shelter adjacent to mobilizer fittings at shelter endwalls.

4-10. (cont)

(3) Position Dollyset brackets to connect with shelter mobilizer fittings and secure Dollyset to shelter.

(4) Operate Dollyset according to Dollyset technical manual to raise shelter to towing height.

(5) Connect towing equipment to Dollyset tow bar.

(6) When shelter is in desired position, operate Dollyset to lower shelter and remove Dollyset sections.

e. Dollyset lifting from ISO fittings.

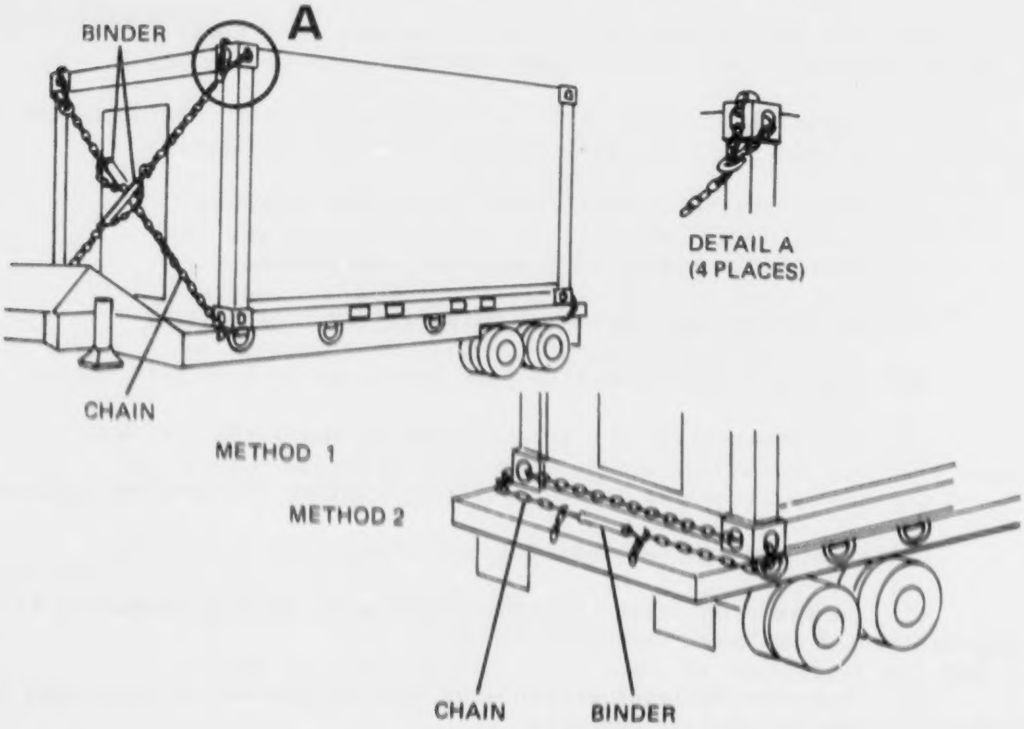
(1) Separate Dollyset sections and prepare for use observing all recommendations of Dollyset technical manual.

(2) Position Dollyset sections at ends of shelter adjacent to ISO fittings at shelter endwalls.

(3) Position Dollyset brackets to connect with shelter ISO fittings and secure Dollyset to shelter.

(4) Operate Dollyset according to Dollyset technical manual to raise shelter to towing height.

(5) Connect towing equipment to Dollyset tow bar.



2-10. (cont)

(6) When shelter is in desired position, operate Dollyset to lower shelter and remove Dollyset sections.

f. Trailer or flatbed transporting.

(1) Using four 14-foot chains and four binders, secure shelter to trailer or flatbed as shown in method 1.

(2) Using two 20-foot chains and two binders or four 6-foot chains and two binders, secure shelter to trailer or flatbed as shown in method 2.

g. Railroad transporting.

(1) Place floor timbers along the front and rear of the shelter contacting lower ISO fittings.

NOTE

Make sure timber is new and has no structural weakness.

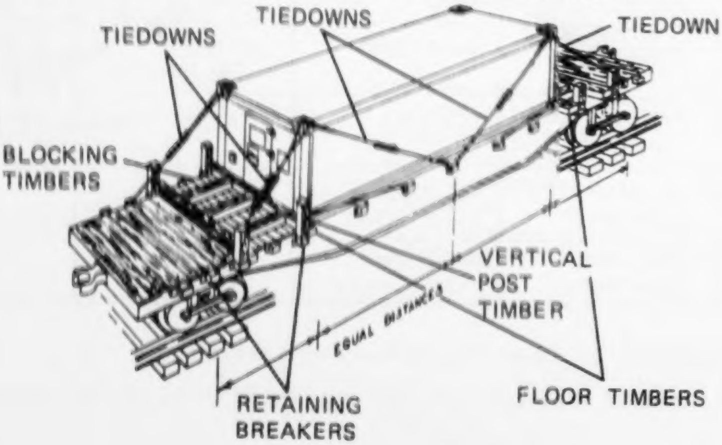
(2) Tie the shelter down to the retaining brackets on the railroad car with 1/2-inch diameter wire rope and turn buckles.

(3) Place 8 inch by 8 inch blocking timbers on the railroad car floor with the edge grain laid flatwise.

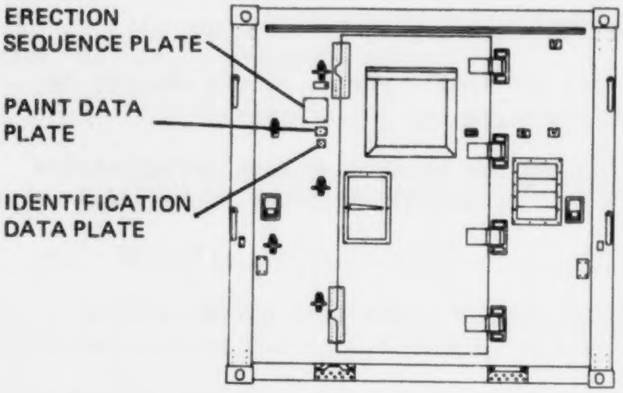
(4) Place at least four 4 inch by 5 inch vertical post timbers with edge grain oriented fore and aft at each end of the shelter.

(5) Bolt the ends of the floor timbers to the vertical post timbers using 3/4-inch diameter bolts.

(6) Spike or nail the vertical post timbers through the retaining brackets on the railroad car to prevent vertical movement.



2-11. LOCATION OF IDENTIFICATION AND INSTRUCTION PLATES. The following figure provides location and contents of identification and instruction plates for the shelter.



SER NO ☐

CONTRACT NO: DAAK60-84-C-0016

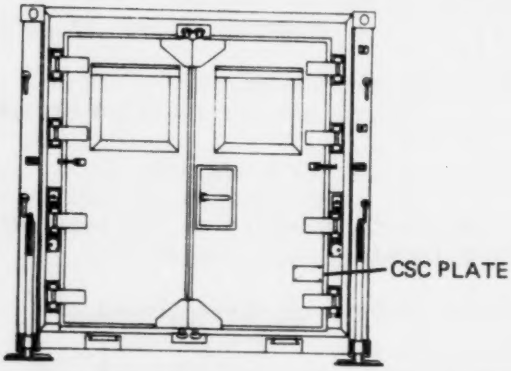
SHELTER, TACTICAL, EXPANDABLE
ONE SIDE

DSGN ACT: 81337 MFR: 05699

PART NO: 5-4-2828-1

NSN 5411-01-124-1377

US



CSC SAFETY APPROVAL

COUNTRY OF APPROVAL USA

DATE MANUFACTURED ☐

IDENTIFICATION NO NSN 5411-01-124-1377

MAXIMUM GROSS WEIGHT 6,804 KG 15,000 LB

ALLOWABLE STACKING WEIGHT
FOR 1.8 G 90,718 KG 200,000 LB

RACKING TEST LOAD VALUE 15240 KG 33 600 LB

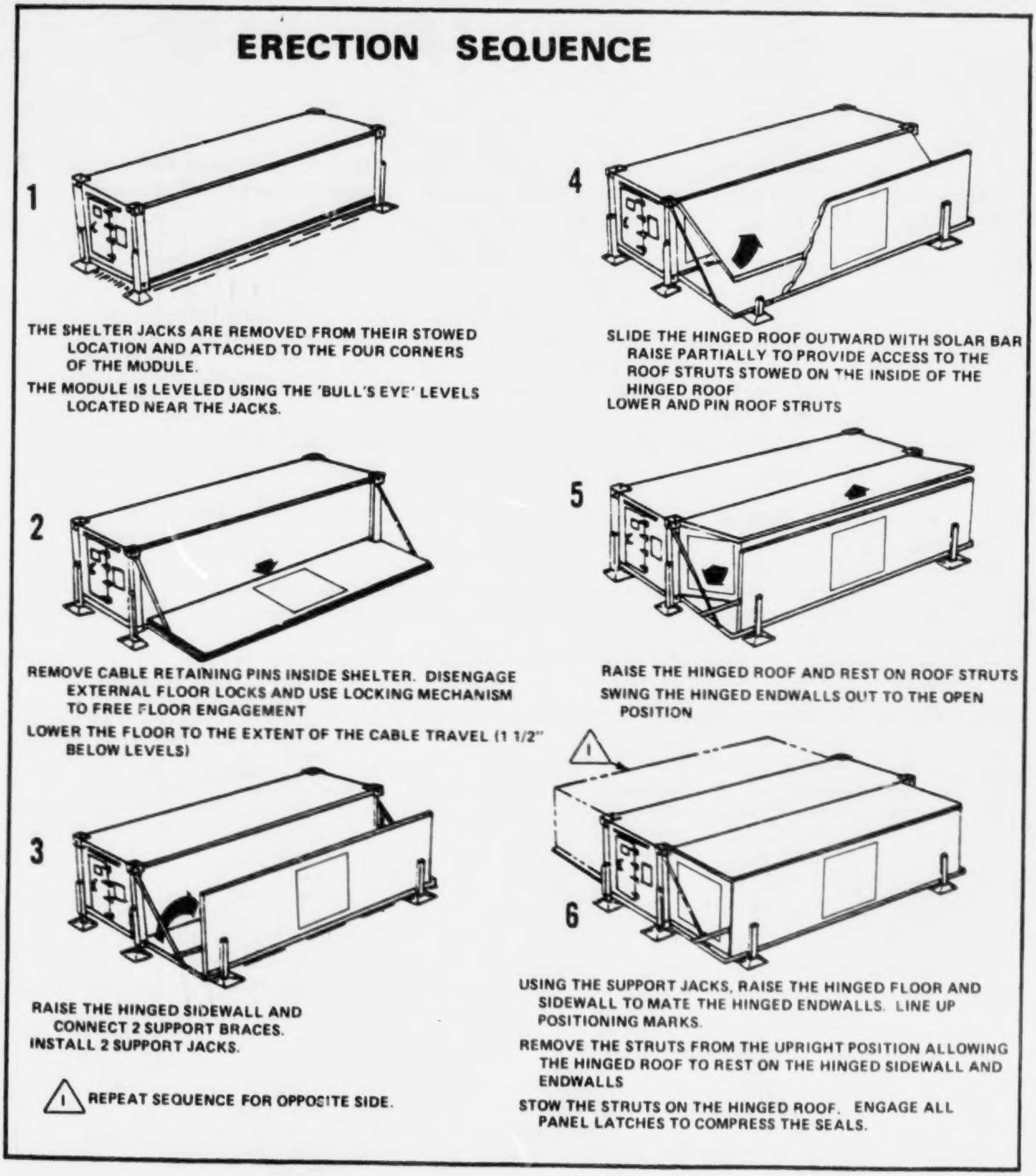
REINSPECTION DUE DATE ☐

APPLY
REINSPECTION DECAL
HERE

	PAINT TYPE	MIL SPEC COLOR	COLOR CODE FED-STD-595	NSN
INTERIOR PAINT	URETHANE ALIPHATIC ISOCYANATE	MIL-C-83286 GLOSS WHITE	17925 COATING	8010-00-181-8282
EXTERIOR PAINT	ALIPHATIC POLYURETHANE	MIL-C-46168 SAND	COATING	
PRIMER	EPOXY POLYAMIDE	MIL-P-23377	PRIMER COATING	8010-00-142-9279
FLOOR PRIMER	ZINC CHROMATE	TT-P-1757	PRIMER	8010-00-515-2208
FLOOR PAINT	WALKWAY COMPOUND	MIL-W-5044 TYPE I GRAY	26251	
FLOOR PAINT	WALKWAY COMPOUND	MIL-W-5044 TYPE II GRAY	26251	

Location of Identification and Instruction Plates

2-11. (cont)



ERECTION SEQUENCE

1

THE SHELTER JACKS ARE REMOVED FROM THEIR STOWED LOCATION AND ATTACHED TO THE FOUR CORNERS OF THE MODULE.

THE MODULE IS LEVELED USING THE 'BULL'S EYE' LEVELS LOCATED NEAR THE JACKS.

2

REMOVE CABLE RETAINING PINS INSIDE SHELTER. DISENGAGE EXTERNAL FLOOR LOCKS AND USE LOCKING MECHANISM TO FREE FLOOR ENGAGEMENT

LOWER THE FLOOR TO THE EXTENT OF THE CABLE TRAVEL (1 1/2" BELOW LEVELS)

3

RAISE THE HINGED SIDEWALL AND CONNECT 2 SUPPORT BRACES.

INSTALL 2 SUPPORT JACKS.

⚠ REPEAT SEQUENCE FOR OPPOSITE SIDE.

4

SLIDE THE HINGED ROOF OUTWARD WITH SOLAR BAR RAISE PARTIALLY TO PROVIDE ACCESS TO THE ROOF STRUTS STOWED ON THE INSIDE OF THE HINGED ROOF

LOWER AND PIN ROOF STRUTS

5

RAISE THE HINGED ROOF AND REST ON ROOF STRUTS

SWING THE HINGED ENDWALLS OUT TO THE OPEN POSITION

6

USING THE SUPPORT JACKS, RAISE THE HINGED FLOOR AND SIDEWALL TO MATE THE HINGED ENDWALLS. LINE UP POSITIONING MARKS.

REMOVE THE STRUTS FROM THE UPRIGHT POSITION ALLOWING THE HINGED ROOF TO REST ON THE HINGED SIDEWALL AND ENDWALLS

STOW THE STRUTS ON THE HINGED ROOF. ENGAGE ALL PANEL LATCHES TO COMPRESS THE SEALS.

Location of Identification and Instruction Plates

2-12. SHELTER EXPANSION

NOTE

Four personnel are required to perform the following procedures.

a. Remove four container lift jacks from inside of personnel and right cargo doors by turning locking handle to loosen jack attachment insert and removing safety pin.

b. Position jacks at each corner of shelter.

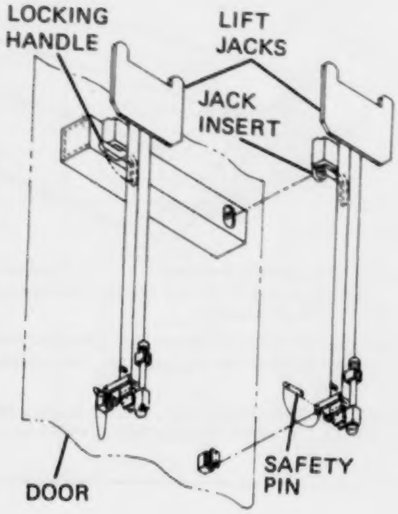
NOTE

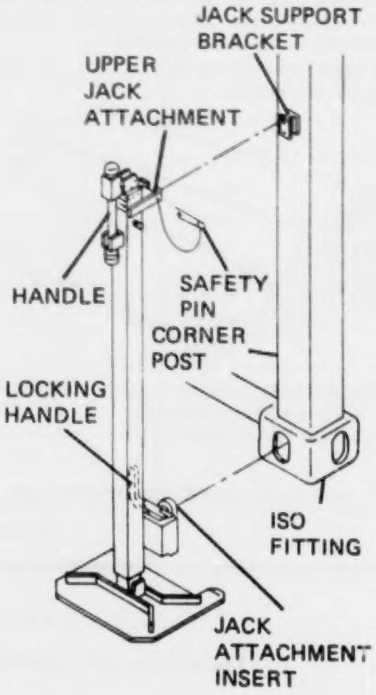
Stencil on jack indicates handle rotation to raise or lower jack.

c. Rotate handle to raise jack until insert will enter lower ISO fitting and upper jack attachment engages jack support bracket on corner post.

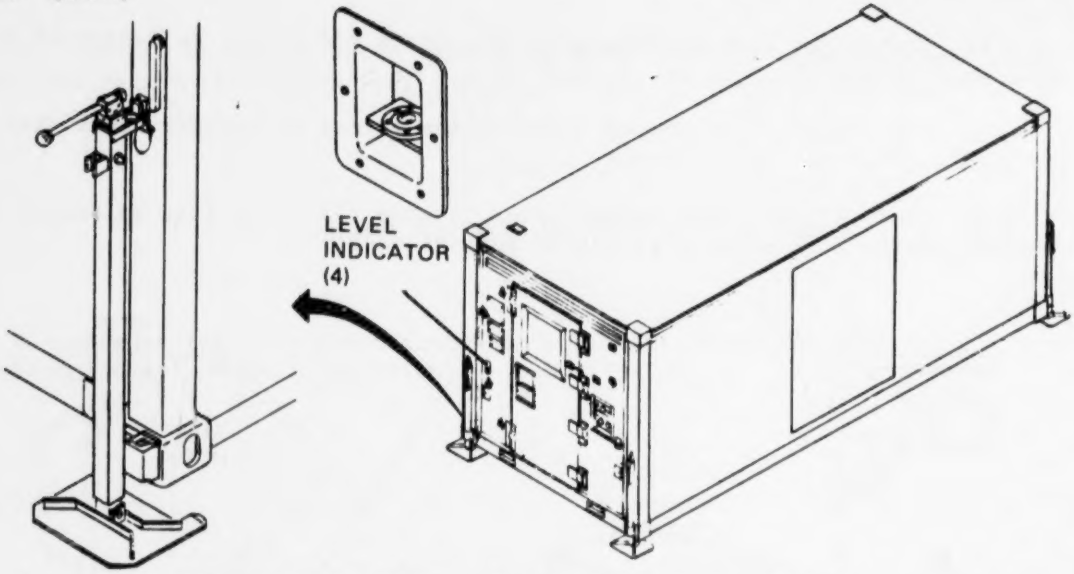
d. Turn locking handle to rotate insert in ISO fitting. Install safety pin.

e. Repeat steps c and d at three remaining corner posts.


LOCKING HANDLE
LIFT JACKS
JACK INSERT
DOOR
SAFETY PIN


JACK SUPPORT BRACKET
UPPER JACK ATTACHMENT
HANDLE
SAFETY PIN
CORNER POST
LOCKING HANDLE
ISO FITTING
JACK ATTACHMENT INSERT

2-12. (cont)



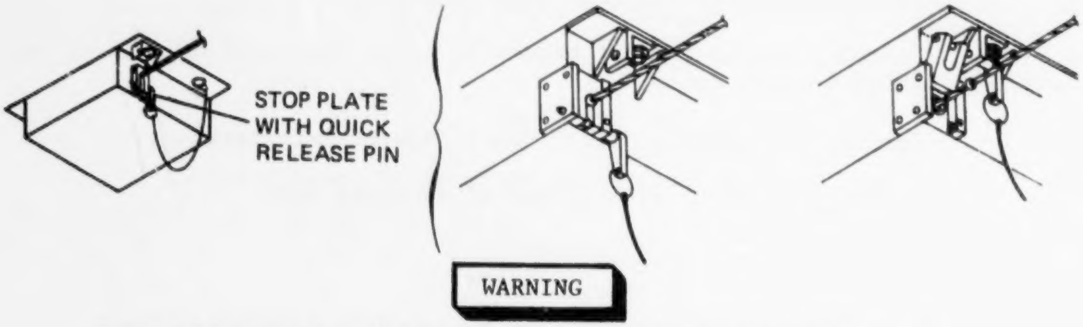
f. Raise all jacks simultaneously at each corner of shelter to prevent excessive strain on jacks or shelter.

NOTE

The shelter shall be raised a minimum of 3 inches (7.6 cm) off ground.

g. Watch level indicators at each corner and adjust jacks as needed in order to level shelter.

h. Remove quick release pins from stop plates on both load balancers (inside shelter) of the side of the shelter being expanded to permit support cable travel.



WARNING

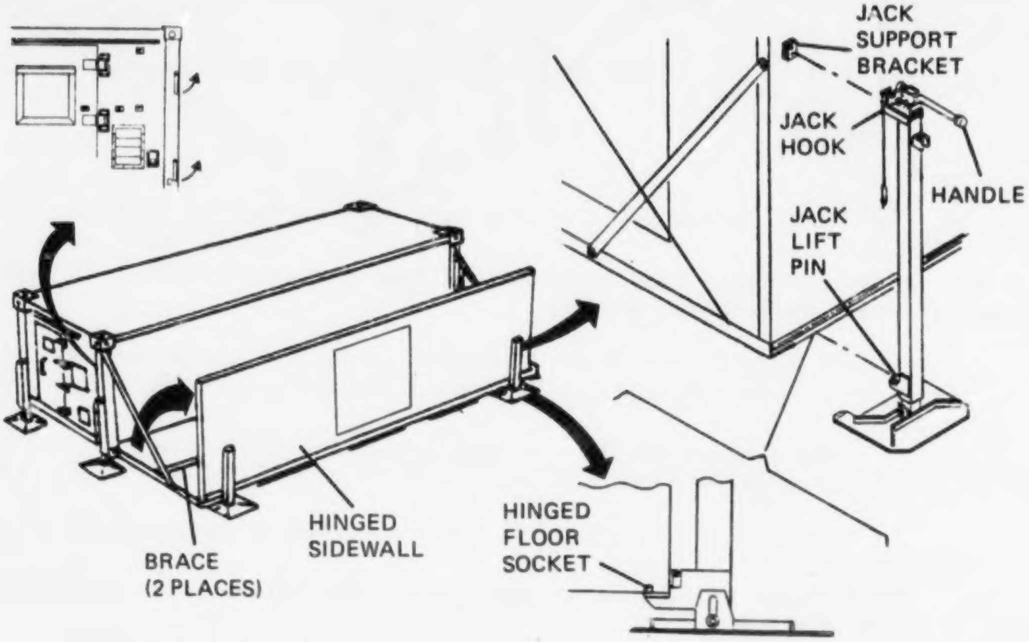
Expandable section (hinged floor and hinged sidewall together) weighs 700 pounds (318 kg). Do not stand directly in front of hinged section.

2-12. (cont)

i. Raise cam lock handles on corner posts and rotate as indicated to disengage hinged floor locks.

j. Carefully lower hinged floor to the extent of support cable travel (1-1/2 in. (3.8 cm) below level).

k. Install two quick release pins in stop plates on load balancers (inside shelter) to prevent return of support cable.


JACK SUPPORT BRACKET
JACK HOOK
HANDLE
JACK LIFT PIN
HINGED FLOOR SOCKET
HINGED SIDEWALL
BRACE (2 PLACES)

l. Remove two support braces from equipment container.

m. Raise hinged sidewall and hold in position.

n. Install the two support braces in brace cups on hinged floor and sidewall behind support cable.

o. Remove two leveling jacks from inside of left cargo door.

p. Position jacks at each corner of expanded side.

NOTE

Stencil on jack indicates handle rotation to raise or lower jack.

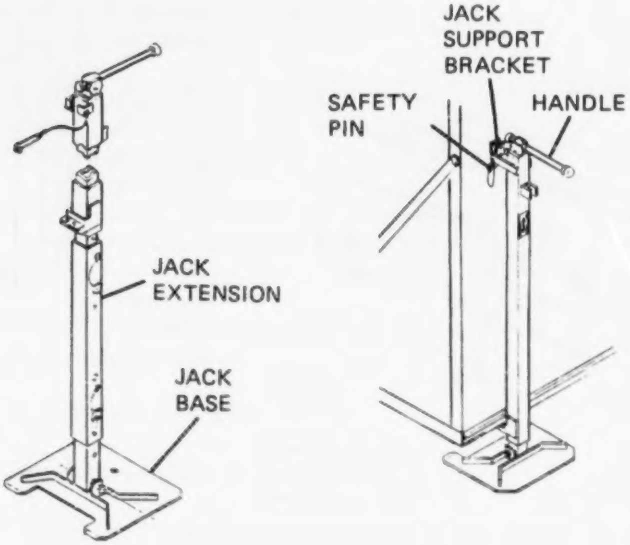
2-12. (cont)

q. Rotate handle to raise jack until jack lift pin engages hinged floor socket and jack hook engages jack support bracket on hinged sidewall.

NOTE

If side jacks are not high enough, perform step r.

r. Remove two jack extensions from equipment container and install between jack base and upper section of jack.



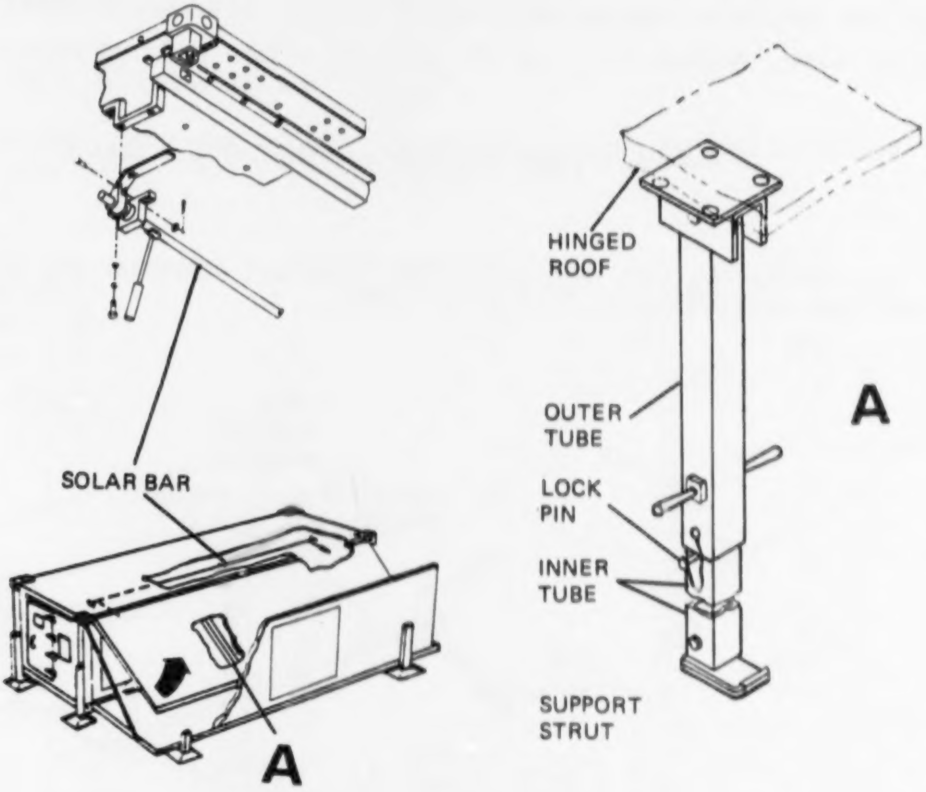
s. Rotate handle to raise jack until safety pin can be installed in jack support bracket.

NOTE

Do not attempt to level or raise floor at this time.

t. Push two handles of solar bar on inside of fixed roof to their extent simultaneously to slide hinged roof outward.

2-12. (cont)


SOLAR BAR
A
HINGED ROOF
A
OUTER TUBE
LOCK PIN
INNER TUBE
SUPPORT STRUT

CAUTION

Support inner tube while disengaging support struts from stowage brackets.

u. Pull lock pin to free support struts from stowage bracket and swing downward.

v. Extend inner tube of strut and insert lock pin when pin holes in inner tube and outer tube are in alignment.

w. Raise hinged roof to full height of struts using all four personnel: Two on support struts; two to assist at roof.

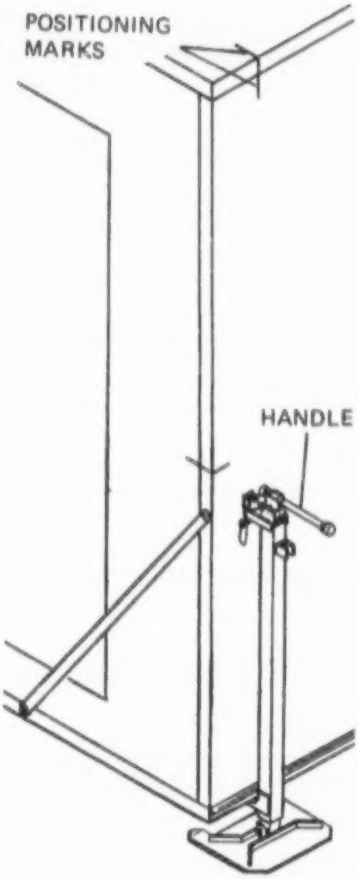
x. Swing hinged endwalls out to open position.

y. Rotate handles to raise both jacks until positioning marks on hinged endwalls and hinged sidewall are in alignment.

2-12. (cont)

CAUTION

Do not continue to jack since this may cause structural damage to hinged endwall.



z. Use support struts to lower hinged roof to rest on hinged endwalls and sidewall.

aa. Remove lock pins from support struts. Compress support struts and secure in support brackets on hinged roof with lock pins.

ab. Adjust leveling jack to make sure positioning marks on hinged roof and hinged sidewall are properly aligned.

ac. Obtain four removable latches from equipment container and install two on hinged sidewall and two on hinged endwalls.

ad. Engage all panel latches to compress seals. Engage nonremovable latches first then removable latches.

ae. Visually check to make sure all seals are properly compressed.

af. Remove support braces.

ag. Stow support braces in equipment container.

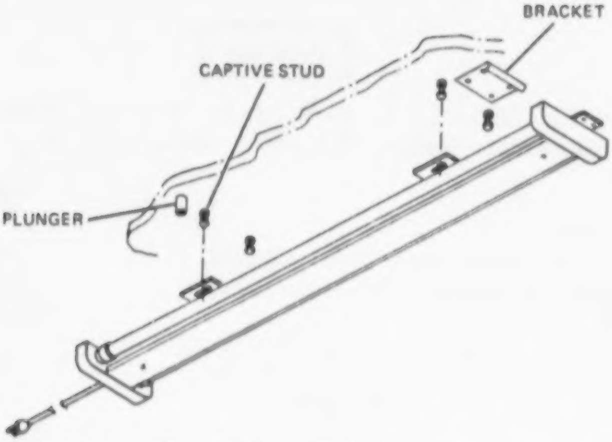
2-13. CEILING LIGHTS AND UTILITY OUTLETS INSTALLATION

a. Ceiling light installation.

WARNING

In the event of lamp breakage, care must be taken in removal of broken glass fragments and white phosphorous dust that may be dispersed within fixture. Inhalation of phosphorous dust could cause dangerous injury.

2-13. (cont)



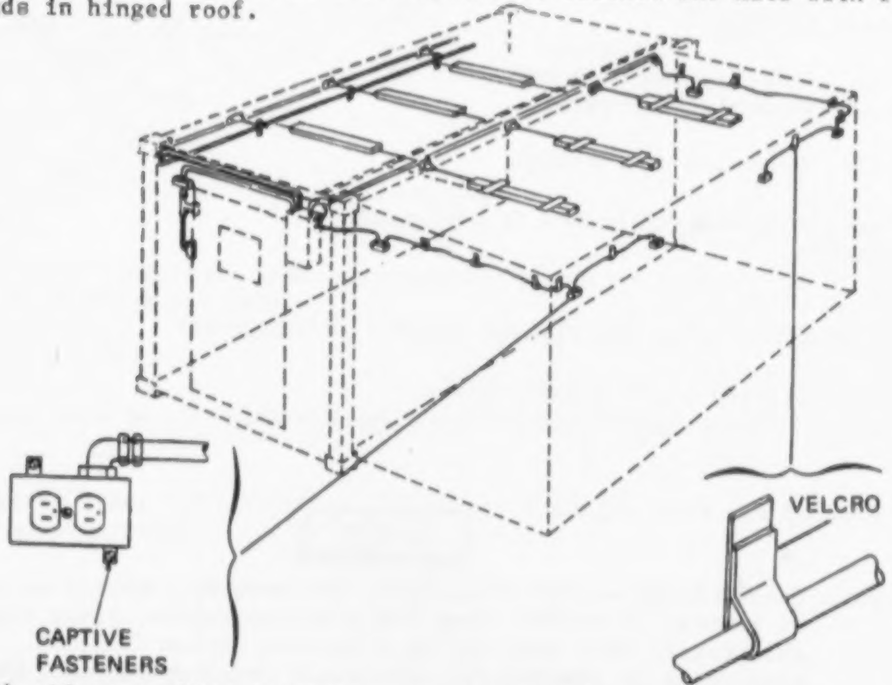
(1) Set circuit breaker CB6 to "Off" position.

(2) Remove power cord from stowage clip on ceiling.

(3) Depress plunger lock in fixed roof light stowage bracket.

(4) Move entire light fixture lengthwise toward power cord end to disengage light from the four captive studs in fixed roof.

(5) Move light fixture into expandable section and mate with four captive studs in hinged roof.



(6) After ceiling light is properly seated, secure fixture by moving until spring loaded plunger engages.

(7) Plug power cord into connector, and twist one-quarter turn to lock in.

2-13. (cont)

(8) Repeat this procedure for each of two remaining ceiling lights.

b. Cable and receptacle assembly installation.

(1) Release captive fasteners and reposition receptacles from stowed position on hinged endwall to operating position on hinged endwalls and hinged sidewall.

(2) Position receptacles with power cords facing up.

(3) Secure flexible cable with velcro straps.

2-14. AREA LIGHT INSTALLATION

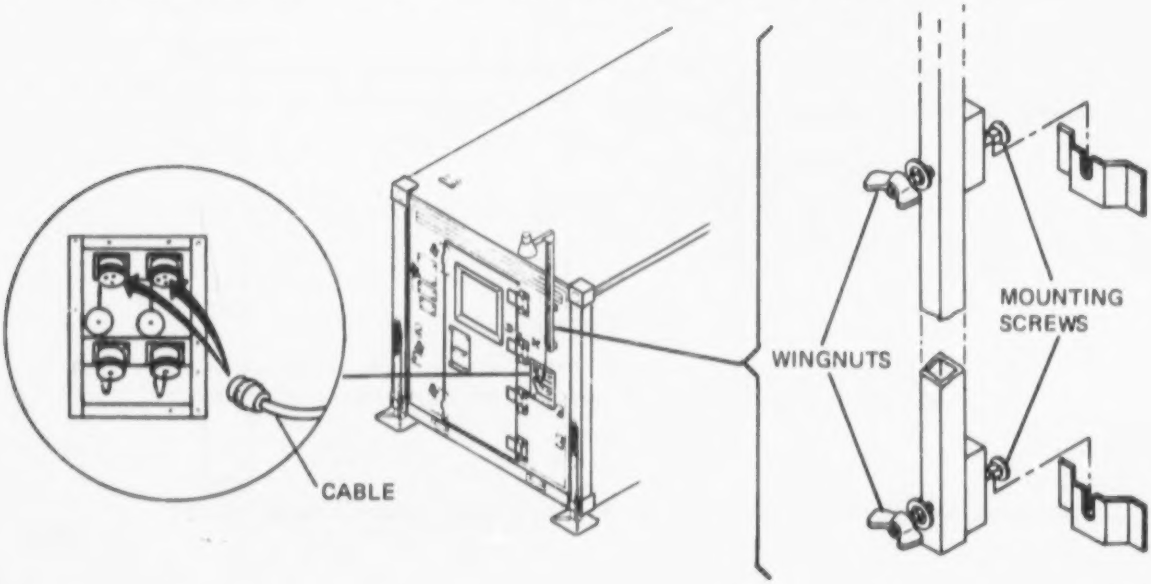
a. Loosen wingnuts and remove area light from stowage location inside shelter on personnel end panel.

NOTE

Do not remove wingnuts from screws.

b. Remove bulb from equipment container and screw bulb into light socket.

c. Install the area light on the fixed personnel or cargo endwall by mating the headed end of the mounting screws with the brackets provided.



2-14. (cont)

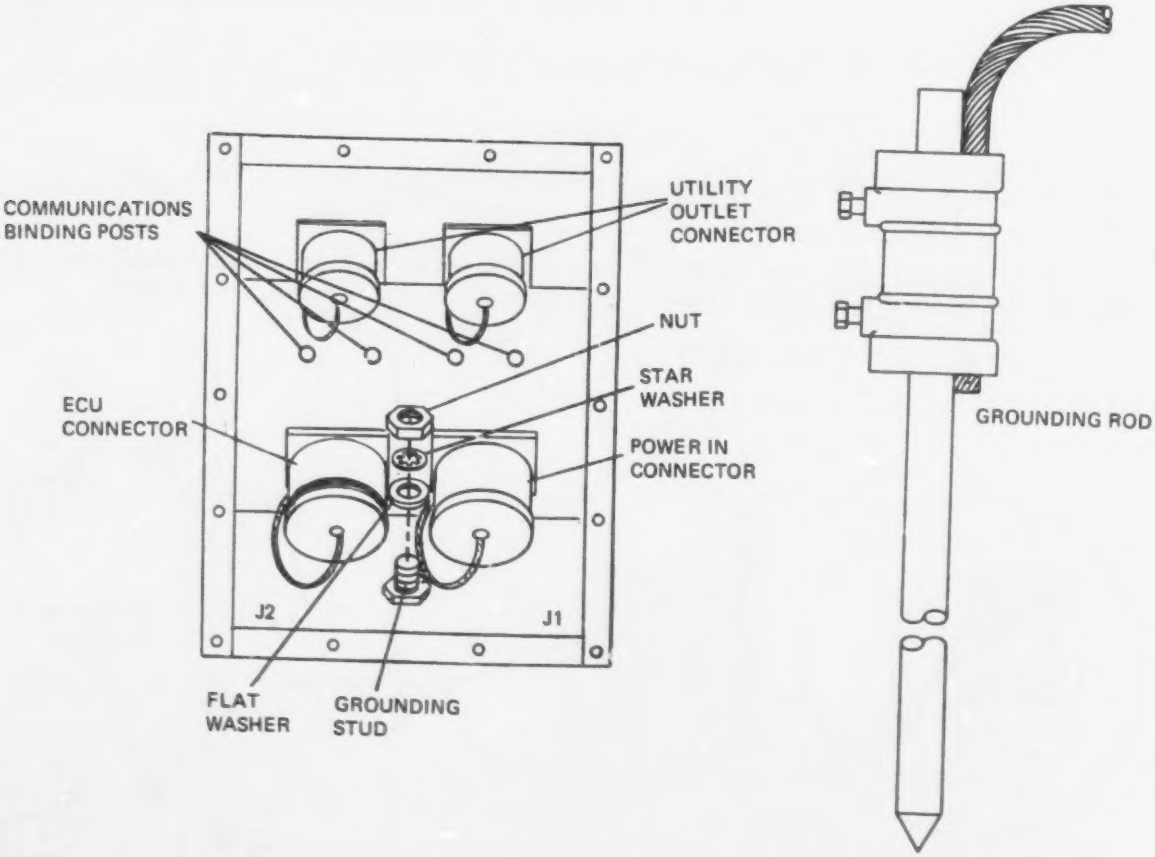
d. Secure the area light to the mounting brackets by tightening the two wingnuts.

NOTE

When the area light is installed at cargo end of shelter the cable is routed over the top of the shelter. The excess cable slack should be neatly coiled on the area light post so that it does not present a hazard to personnel.

e. Connect cable into J3 or J4 connectors on the power entry panel.

2-15. EXTERNAL CONNECTIONS.


COMMUNICATIONS BINDING POSTS
UTILITY OUTLET CONNECTOR
NUT
STAR WASHER
ECU CONNECTOR
POWER IN CONNECTOR
GROUNDING ROD
J2
J1
FLAT WASHER
GROUNDING STUD

2-15. (cont)

a. Shelter grounding

NOTE

Shelter is grounded through externally connected power supply. Additional grounding, depending on local conditions, may be installed by utilizing optional grounding rod, Appendix D.

(1) Drive ground rod into earth at a suitable location that permits ground cable attached to rod to reach ground stud on power entry panel.

(2) On power entry panel remove nut, star washer, and flat washer on stud.

(3) Connect ground cable connector to stud and secure with washer, star washer, and nut.

(4) Check all connections for security.

b. Input power connection

WARNING

Do not attempt connection of live line to power entry panel. Deactivate power source or generator before procedure.

CAUTION

Power supply shall be 120/208VAC, 4 Wire with ground, 3 Phase or damage to equipment will result.

(1) Turn all circuit breakers to OFF position.

NOTE

Make certain that power entry panel and power supply cable are terminated with same type of connector.

(2) Connect power supply cable to power entry panel at connector (J1).

2-15. (cont)

(3) Turn MAIN circuit breaker to ON position and observe any unusual conditions.

(4) Turn remaining circuit breakers to ON position one at a time and observe any unusual conditions.

c. ECU Connection.

(1) Turn CB1 to OFF position.

(2) Connect ECU supply cable to connector (J2).

(3) Turn CB1 to ON position and observe for any unusual conditions.

2-16. CLOSING SEQUENCE

NOTE

Four personnel are required to perform the following procedures.

Make sure hinged floor is clear of items or debris and floor hinges are clean of sand or dirt.

Make sure top of hinged roof is clear of items, debris, snow, or ice and hinged floor extension is clear of foreign matter, snow or ice.

Do not attempt to lower or remove container lift jacks until after procedures in steps a through q have been completed.

a. Remove power cord from power entry panel.

b. Remove ECU intake and return panels and replace with closeout panels.

c. Remove hinged roof area ceiling lights and receptacles from expanded section and return to their stowage position.

d. Remove and stow latch plates in equipment container.

WARNING

It is essential that the complete latch is pressed flat into the pan.

2-16. (cont)

e. Release all latches between hinged sidewall, endwall, roof, and floor.

f. Lower support struts and raise hinged roof to full extent of strut.

g. Disengage quick release pin and stop plate for cable on load balancer.

h. Lower hinged floor with leveling jacks.

i. Fold in hinged endwall to roof beam and hold in place with velcro straps.

j. Lower hinged roof by using support struts and personnel at each end of roof.

k. Slide hinged roof inward to stowage position by pulling down on solar bar handles.

l. Remove leveling jacks supporting hinged floor and stow on left cargo door.

m. Remove sidewall support braces and store in equipment container.

WARNING

To avoid injury, be careful not to get caught between cable and sidewall panel. Do not attempt to control panel if it is accidentally dropped.

n. Fold down hinged sidewall onto hinged floor. Allow wall to free fall before it comes to the same plane as the cables. Trapped air acts as a cushion.

o. Position camlocks so handles are horizontal and outward.

p. Raise hinged floor and camlock to corner post. Engage lower locks first. Make sure pins are in holes.

NOTE

If hinged floor and corner post bind, relevel shelter.

q. Close cargo doors.

2-16. (cont)

r. Remove container lift jacks and stow on personnel and right cargo doors.

NOTE

If it is intended to use a dollyset to move shelter, place pieces of 4x4 lumber under the frame and clear of the ISO fittings to facilitate mounting of the dollyset.

s. Stow power cable inside shelter.

t. Check security of shelter. Quick release pins must be inserted in stop plates on load balancer. Place padlocks on outside door handles.

Section IV. OPERATION UNDER USUAL CONDITIONS

NOTE

If equipment fails to operate, refer to troubleshooting procedures in Chapter 3.

2-17. OPERATING INSTRUCTIONS. Due to the limited operating capability of shelter, operating instructions are limited to operation of circuit breakers and switches for the purpose of providing power to lights, outlets, and externally connected environmental control unit (ECU), if installed. Expanding the shelter and closing the shelter includes maintaining the shelter when performing any PMCS exercise "During" functions.

Section V. OPERATION UNDER UNUSUAL CONDITIONS

2-18. GENERAL. This section provides instructions for operation of the shelter in unusual weather conditions. Operation during blackout conditions is also provided.

2-19. OPERATION IN RAIN AND/OR MUD

a. Provide adequate drainage ditch to prevent standing water around shelter area.

b. Check leveling jacks frequently for sinking; level shelter as required by adjusting container lift jacks.

c. Close and secure all doors in shelter.

d. Check seals for proper placement and compression.

2-20. OPERATION IN SNOW, ICE OR EXTREME COLD

WARNING

In extreme cold, do not touch metal parts with bare hands. Severe skin damage may result.

a. Remove snow routinely and prior to folding roof with a soft bristle brush, broom, or equivalent.

b. Remove ice from shelter before lowering hinged panels.

c. Insure ECU is properly connected to shelter.

d. Keep all doors and vents closed.

NOTE

Fluorescent lights have a delay time in coming on at temperatures of 0°F and below.

2-21. OPERATION IN HIGH WINDS.

WARNING

To avoid injury when expanding or closing hinged sidewall in high winds, use six personnel.

2-21. (cont)

NOTE

Two personnel are required to perform the following procedure.

a. To install the storm configuration (tie-down installation) kit, use the following items.

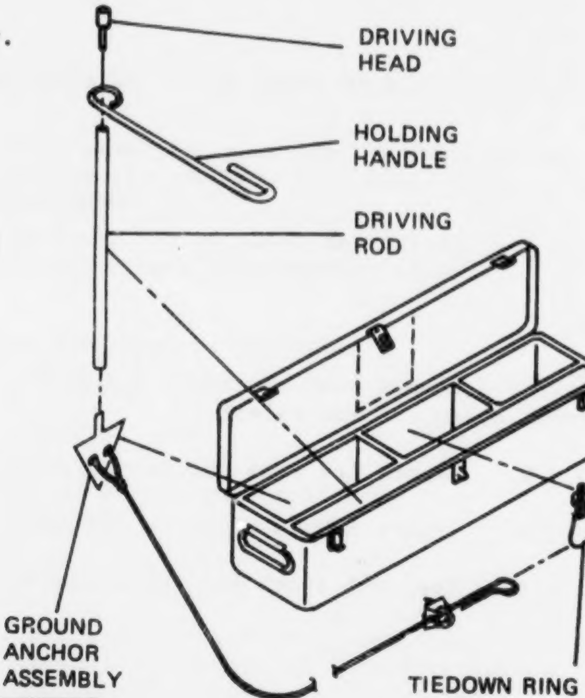
(1) Ground anchor assembly.

(2) Driving rod.

(3) Holding handle.

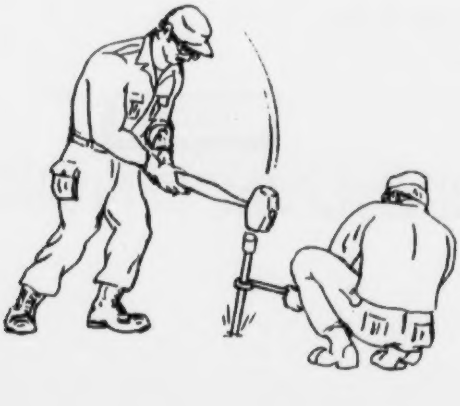
(4) Driving head.

(5) Tiedown ring.


DRIVING HEAD
HOLDING HANDLE
DRIVING ROD
GROUND ANCHOR ASSEMBLY
TIEDOWN RING

WARNING

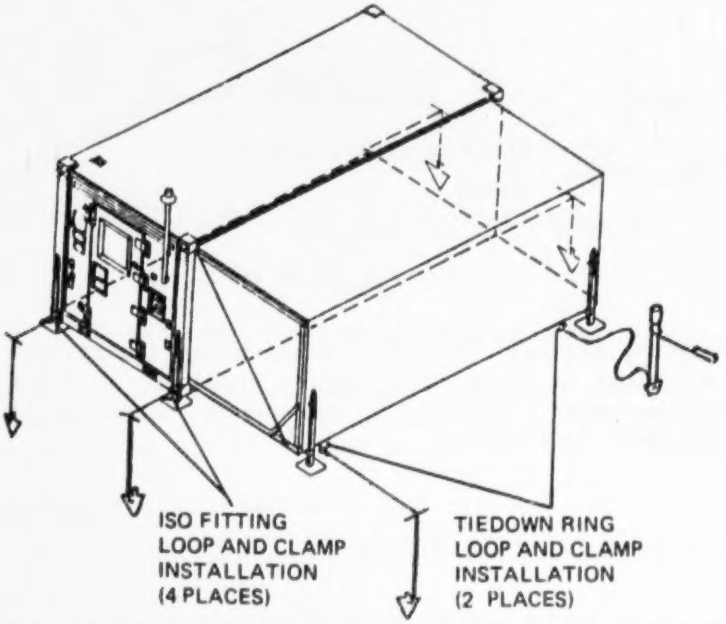
Safety glasses must be worn by personnel when installing ground anchors.



2-21. (cont)

b. One person shall support driving rod with holding handle, while second person drives ground anchor into ground using 12-pound sledge hammer, Appendix D.

c. Drive each of six loop and clamp ground anchors into ground approximately 3 feet (91.5 cm) deep, and as close as possible to the shelter attaching points, at locations indicated below.

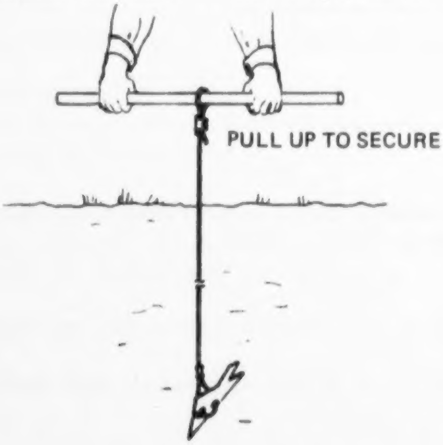

ISO FITTING
LOOP AND CLAMP
INSTALLATION
(4 PLACES)
TIEDOWN RING
LOOP AND CLAMP
INSTALLATION
(2 PLACES)

d. Set each ground anchor by forming a loop in cable end and secure loop with clamp.

e. Insert driving rod through loop and pull up sharply to ensure anchor is set into ground.

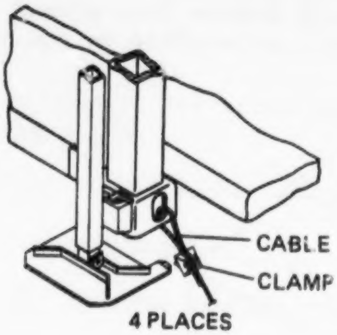
NOTE

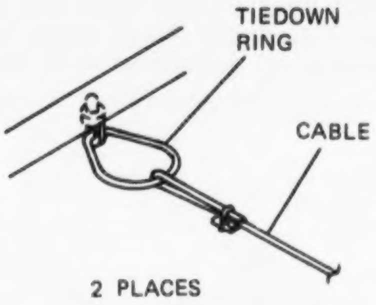
This setting of the anchor is required to turn the anchor in the ground so that it develops maximum holding power.


PULL UP TO SECURE

2-21. (cont)

f. Remove clamp, loop cable at six places (two with tiedown rings) as shown. Replace clamp and tighten clamp nuts.





NOTE

When moving shelter, disassemble storm configuration kit and cut cable as close to ground as possible. Discard cable components. Retain the two tiedown rings and store in equipment container.

2-22. OPERATION DURING BLACKOUT CONDITIONS

NOTE

During blackout condition, enter and leave shelter through personnel door only. Do not operate exterior area light.

a. Activate all interior lights and check from 25 feet (7.6 meters) away to ensure no light is visible.

b. Place blackout override switch to OFF position.

NOTE

Blackout override switch must remain in OFF position for duration.

CHAPTER 3

OPERATOR MAINTENANCE INSTRUCTIONS

Section I. TROUBLESHOOTING PROCEDURES

3-1. GENERAL. This section contains operator troubleshooting information for locating and correcting common malfunctions which may develop in shelter.

WARNING

HIGH VOLTAGE

exists in the electrical system of this equipment

DEATH ON CONTACT

may result if personnel fail to observe safety precautions.

a. Paragraph 3-2 lists common malfunctions which you may find during operation or maintenance of shelter electrical system or components. You should perform inspections and corrective actions in order listed.

b. All malfunctions that may occur and all inspections and corrective actions may not be listed. If a malfunction is not listed or is not corrected by corrective action, notify your supervisor.

c. When troubleshooting operation of shelter electrical system, all switches and circuit breakers shall be placed in OFF positions with power connected.

d. The operator is limited to setting circuit breakers (ON/OFF), setting light assemblies in place, and replacing light bulbs.

3-2. OPERATOR TROUBLESHOOTING

MALFUNCTION
  TEST OR INSPECTION
    CORRECTIVE ACTION

---

1. NO POWER DISTRIBUTION TO SHELTER.

Step 1. Check that outside power is properly connected to service entrance connector on power entry panel, and check general condition of cable and connectors.

a. Make proper power connection.

b. Check for defective cable or connectors.

3-2. (cont)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 2. Check and reset main circuit breaker, and check outside power.

Notify organizational maintenance.

2. INCANDESCENT LIGHT FAILS TO COME ON.

Step 1. Check and reset circuit breaker.

Step 2. Check visually for burned out incandescent bulb.

Change bulb. (Refer to paragraph 4-10.)

Step 3. Check operation of incandescent light switch and blackout override switch.

Notify organizational maintenance.

WARNING

In the event of lamp breakage, care must be taken in removal of broken glass fragments and white phosphorous dust that may be dispersed within fixture. Inhalation of phosphorous dust could cause serious injury.

3. ALL FIXED ROOF AREA AND HINGED ROOF AREA CEILING LIGHTS FAIL TO COME ON.

Step 1. Check operation of fluorescent light switch and blackout override switch.

Step 2. Check and reset circuit breaker.

Notify organizational maintenance.

4. ONE OR MORE HINGED ROOF AREA CEILING LIGHTS FAIL TO COME ON.

Step 1. Check to see if associated flexible cable connector is properly plugged in.

Make proper connection.

3-2. (cont)

MALFUNCTION
  TEST OR INSPECTION
    CORRECTIVE ACTION

Step 2. Check associated flexible cable and connectors for defects.

Notify organizational maintenance.

Step 3. Check visually for burned out fluorescent lamps.

a. Unplug flexible cable connector and replace lamp. (Refer to paragraph 3-5.)

b. Reconnect flexible cable connector.

5. ONE OR MORE FIXED ROOF AREA CEILING LIGHTS FAIL TO COME ON.

Check visually for burned out fluorescent lamps.

a. Turn off appropriate circuit breaker and replace lamp. (Refer to paragraph 4-12.)

b. Turn on appropriate circuit breaker.

6. NO POWER AT ONE OR MORE INTERIOR UTILITY OUTLETS.

Check and reset associated circuit breakers.

Notify organizational maintenance.

7. NO POWER AT ONE OR BOTH EXTERIOR UTILITY OUTLETS.

Check and reset circuit breaker.

Notify organizational maintenance.

8. AREA LIGHT FAILS TO COME ON.

Step 1. Check and reset circuit breaker.

Step 2. Check visually for burned out bulb.

Change bulb.

Notify organizational maintenance.

3-2. (cont)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

---

9. NO POWER AT HEATER/AC SUPPLY.

Step 1. Check that outside power is properly connected to service entrance connector on power entry panel, and check general condition of cable and connectors.

a. Make proper power connection.

b. Check for defective cable or connectors.

Step 2. Check and reset circuit breakers.

Notify organizational maintenance.

Section II. OPERATOR MAINTENANCE PROCEDURES

3-3 GENERAL. Authorized maintenance procedures to be performed by operator include replacement of area light assembly, replacement of light bulbs, hinged roof area ceiling lights, hinged panel leveling jack assemblies, endwall closeout panel, sidewall closeout panels, ECU intake panel, ECU return panel, container lift jack assemblies, storm configuration components, support braces, and leveling jack extensions.

3-4. AREA LIGHT ASSEMBLY REPLACEMENT

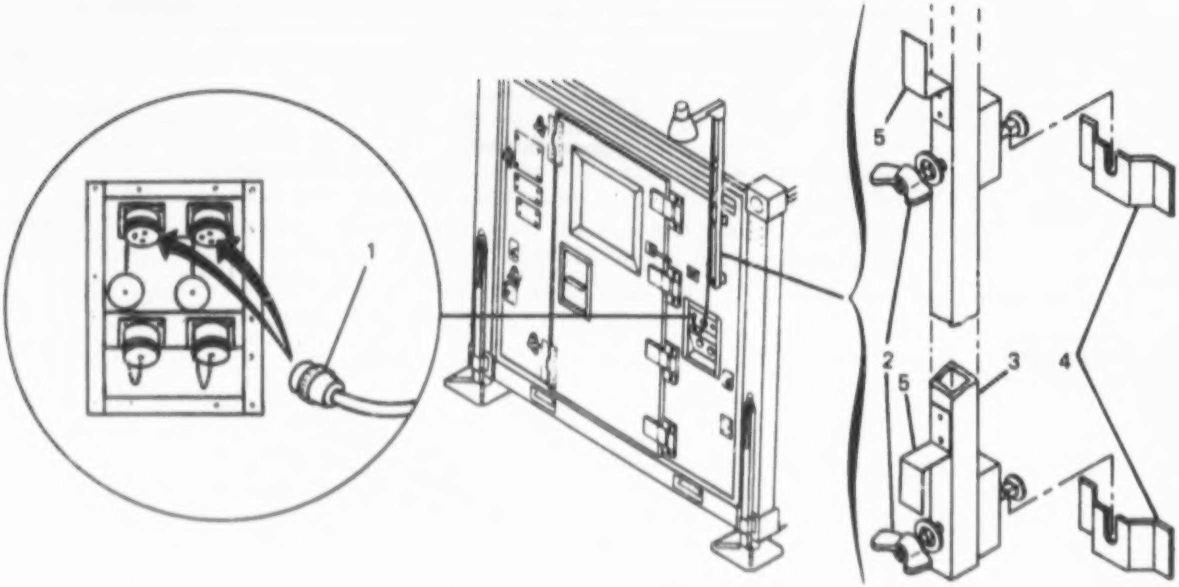
This task covers:
- a. Removal
- b. Installation

WARNING

Disconnect power of circuit involved by setting circuit breaker to off position.

3-4. (cont)

REMOVAL



1. Place circuit breaker CB8 to off position.

2. Disconnect area light assembly connector (1) from power entry panel.

3. Loosen two wingnuts (2) and lift area light assembly (3) from two brackets (4) on shelter.

4. Coil cable on brackets (5) on light post.

INSTALLATION

1. Position post of area light assembly (3) in two brackets (4) on shelter and tighten two wingnuts (2) to secure light to shelter.

2. Connect area light assembly connector (1) to power entry panel.

3. Place circuit breaker CB8 to on position.

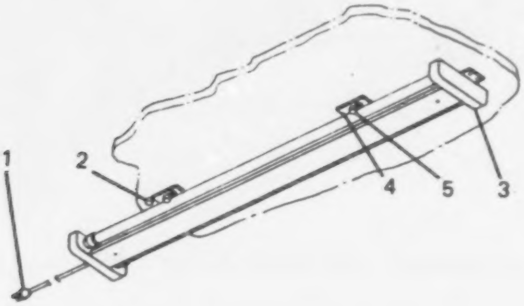
3-5. HINGED ROOF AREA CEILING LIGHT REPLACEMENT

This tasks covers:
a. Removal
b. Installation

WARNING

This fixture contains voltage that is dangerous if contacted. Before replacing hinged roof area ceiling light, make sure that electrical power is completely disconnected from circuit involved.

REMOVAL



1. Place ceiling light switch and circuit breaker CB6 to off position.

2. Unplug cable connector (1) from receptacle outlet (twist-lock type connector).

3. Retract plunger (2) and slide hinged roof area ceiling light (3) toward cable end to disengage two brackets (4) from four captive studs (5) in hinged roof.

INSTALLATION

1. Place hinged roof area ceiling light (3) against hinged roof with holes in two brackets (4) over four captive studs (5).

2. Slide light away from cable end to engage two brackets (4) on four captive studs (5).

3. Plug cable connector (1) in receptacle outlet.

3-6. HINGED PANEL LEVELING JACK ASSEMBLY REPLACEMENT

This task covers:
- a. Removal
- b. Cleaning, Inspection
- c. Installation

INITIAL SETUP

Standard tools
General mechanics tool kit

Personnel - 2

REMOVAL

1. Place sufficient blocks under hinged floor to prevent settling of expanded side when jack is removed.

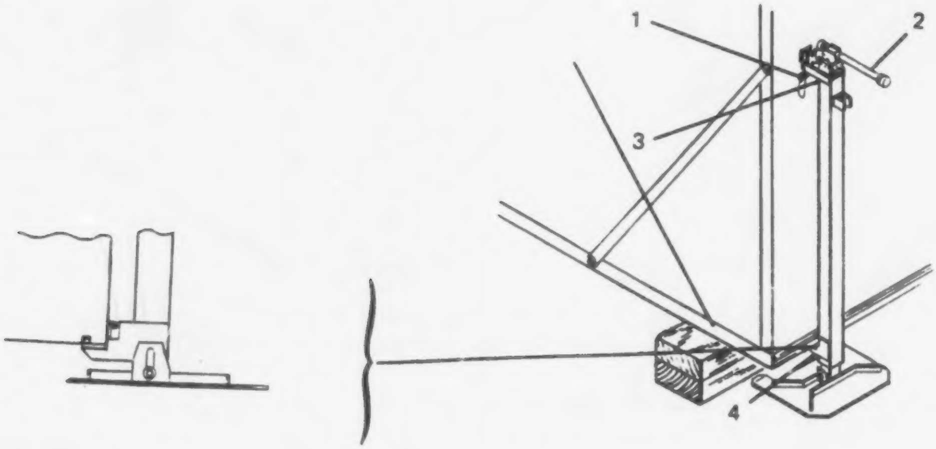
NOTE

Stencil on jack indicates handle rotation to raise or lower jack.

2. Remove safety pin (1).

3. Rotate handle (2) to lower jack until jack hook (3) and jack lift pin (4) are disengaged.

4. Remove jack.



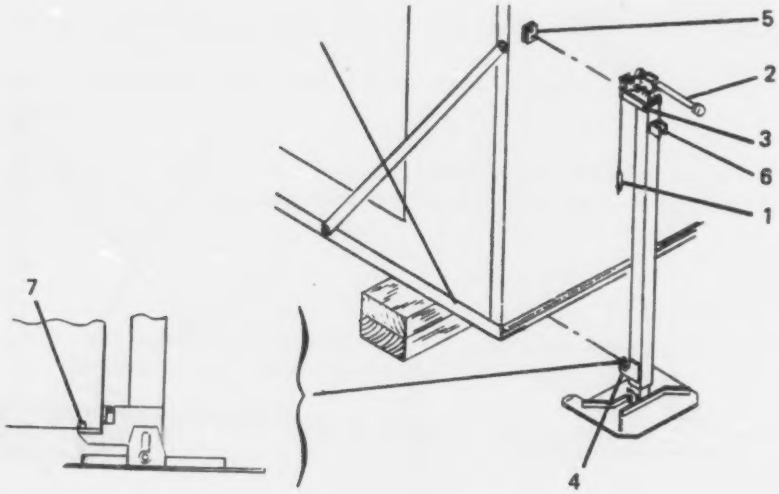
3-6. (cont)

CLEANING, INSPECTION

1. Clean jack assembly and component surfaces.
2. Inspect mounting surfaces for corrosion and damage.
3. Inspect for missing or damaged components.
4. Inspect for corrosion or paint damage.

INSTALLATION

1. Rotate handle (2) to raise jack until jack lift pins (4) engages hinged floor sockets (7) and jack hook (3) engages jack support bracket (5) on hinged sidewall.
2. Install safety pin (1) through jack support bracket (5) under jack hook (3).
3. Rotate handle (2) to raise jack until block is free.
4. Check proper alignment of positioning marks and proper compression and placement of seals.
5. Remove blocks.
6. Swing handle (2) down and secure in locking clip (6).



3-7. ENDWALL CLOSEOUT PANEL REPLACEMENT

This task covers:
- a. Removal
- b. Installation

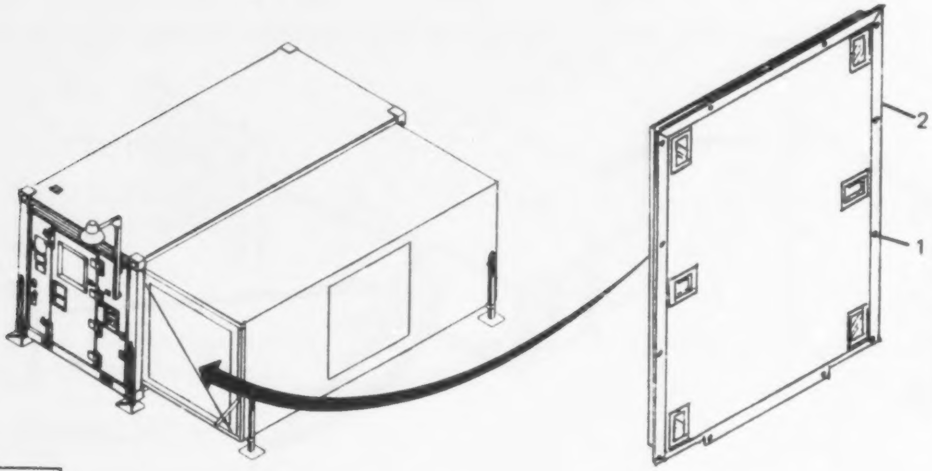
INITIAL SETUP

Standard Tools
General mechanics tool kit
Personnel - 2

REMOVAL

1. Move flexible electrical cable to facilitate removal of endwall closeout panel.

2. Inside shelter, loosen twelve captive screws (1) and remove endwall closeout panel (2).



INSTALLATION

NOTE

Endwall closeout panel (2) is stowed on outside of hinged sidewall when not in use.

Position endwall closeout panel (2) against shelter endwall and secure by tightening twelve captive screws (1), placing bottom end in first.

3-8. SIDEWALL CLOSEOUT, ECU INTAKE, AND ECU RETURN PANELS REPLACEMENT

This task covers:
- a. Removal
- b. Installation

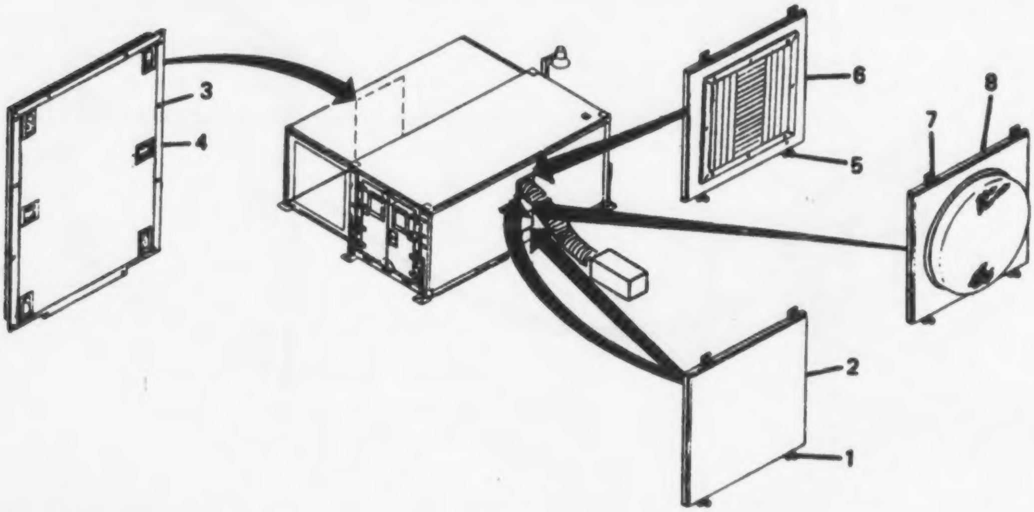
INITIAL SETUP

Standard Tools
General mechanics tool kit
Personnel - 2

REMOVAL

1. If environmental control unit (ECU) panels are installed and ECU is operating, shut down ECU. (Refer to appropriate shelter system manual.)

2. Disconnect ECU ducts. (Refer to appropriate shelter system manual.)



Sidewall Closeout Panels

3. Inside shelter, loosen four captive screws (1) and remove small sidewall closeout panel (2).

4. Inside shelter, loosen twelve captive screws (3) and remove large sidewall closeout panel (4).

3-8. (cont)

ECU Intake Panel

Inside shelter, loosen four captive screws (5) and remove ECU intake panel (6).

ECU Return Panel

Inside shelter, loosen four captive screws (7) and remove ECU return panel (8).

INSTALLATION

NOTE

ECU intake panel (6) and ECU return panel (8), or sidewall closeout panels (2) are stowed in roof panel when not in use. Sidewall closeout panels (4) are stowed on outside of hinged sidewall when not in use.

ECU Return Panel

Position ECU return panel (8) in frame opening and secure by tightening four captive screws (7).

ECU Intake Panel

Position ECU intake panel (6) in frame opening and secure by tightening four captive screws (5).

Sidewall Closeout Panels

1. Position sidewall closeout panel (4) in frame opening bottom first and secure by tightening twelve captive screws (3).
2. Position sidewall closeout panels (2) in frame opening and secure by tightening four captive screws (1).
3. Connect ECU ducts and turn on ECU. (Refer to appropriate shelter system manual.)

3-9. CONTAINER LIFT JACK ASSEMBLY REPLACEMENT

This task covers:
- a. Removal
- b. Cleaning, Inspection
- c. Installation

INITIAL SETUP

Standard tools
General mechanics tool kit

Personnel - 2

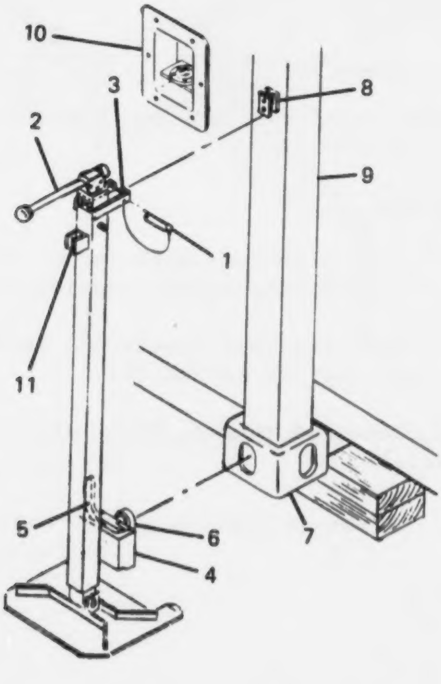
REMOVAL

1. Place sufficient blocks under ISO fitting to prevent settling of shelter when jack is removed.

NOTE

Stencil on jack indicates handle rotation to raise or lower jack.

2. Remove safety pin (1).



3-9. (cont)

3. Rotate handle (2) to lower jack until upper (3) and lower jack attachments (4) will disengage and jack is not supporting shelter.

4. Turn locking handle (5) to rotate insert (6) in ISO fitting (7).

5. Remove jack.

CLEANING, INSPECTION

1. Clean jack assembly and component surfaces.

2. Inspect mounting surfaces for corrosion and damage.

3. Inspect for missing or damaged components.

4. Inspect for corrosion or paint damage.

INSTALLATION

1. Rotate handle (2) to raise jack until insert (6) will enter lower ISO fitting (7) and upper jack attachment (3) engages jack support bracket (8) on corner post (9).

2. Turn locking handle (5) to rotate insert (6) in ISO fitting (7).

3. Install safety pin (1) through jack support bracket (8) under upper jack attachment (3).

4. Watch level indicator (10), and rotate handle (2) to raise jack until shelter is leveled.

5. Swing handle (2) down and secure in locking clip (11).

6. Remove blocks.

3-10. STORM CONFIGURATION COMPONENTS, SUPPORT BRACES, AND LEVELING JACK EXTENSIONS REPLACEMENT

This task covers:
  a. Removal
  b. Installation

INITIAL SETUP

Standard Tools	**References**
General mechanics tool kit	para. 2-21 Operation in High Winds
Personnel - 2	

REMOVAL

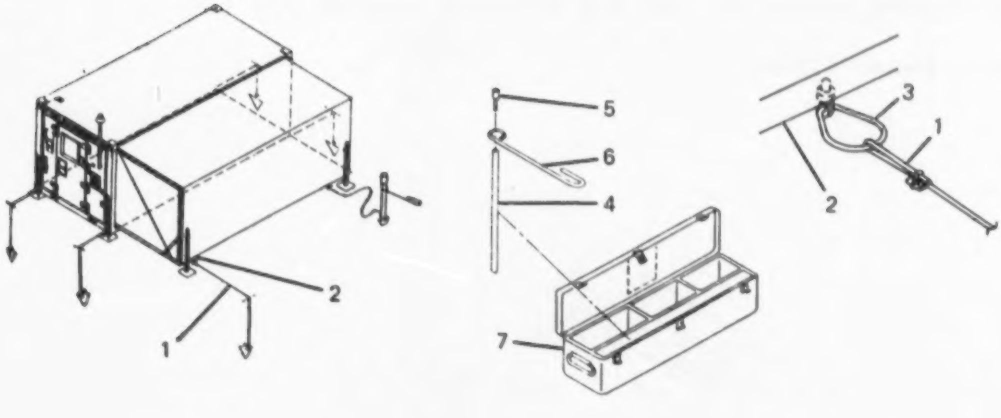
Storm Configuration Components

1. Cut cable of six anchor assemblies (1) as close to ground as possible. Discard cable components.

2. Unscrew two tiedown rings (3) from bottom of hinged floor panel (2). Retain the two tiedown rings and store in equipment container.

NOTE

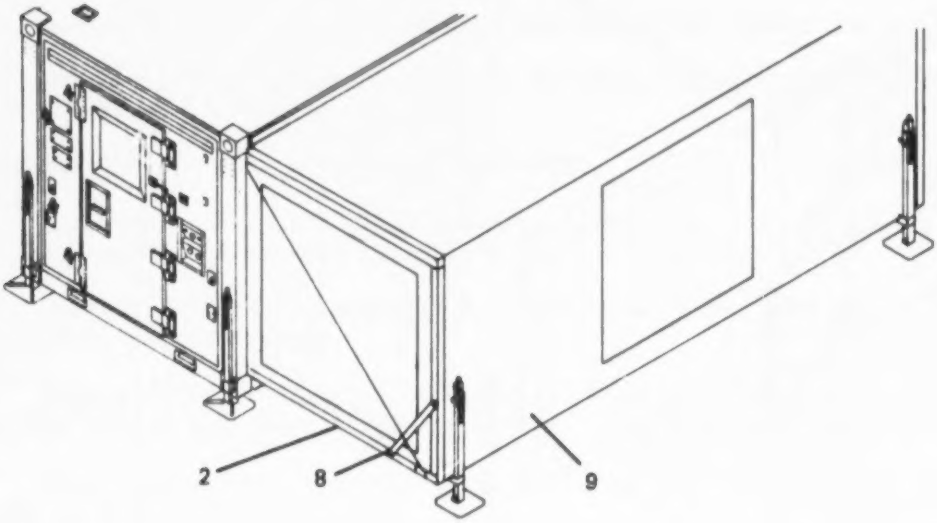
Drive rod (4), drive head (5), and holding handle (6) can be removed from equipment container (7).



3-10. (cont)

Support Braces

Remove support brace (8) from hinged sidewall (9) and hinged floor panel (2) by pulling straight out disengaging pins on brace from holes in panels.

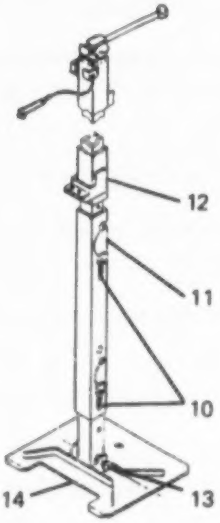


Leveling Jack Extensions

1. Remove two quick-disconnect pins (10) from outside tube of jack extension (11).

2. Lift jack assembly (12) off jack extension (11).

3. Remove pin (13) securing jack extension (11) to base (14) and lift jack extension off base.



INSTALLATION

Leveling Jack Extensions

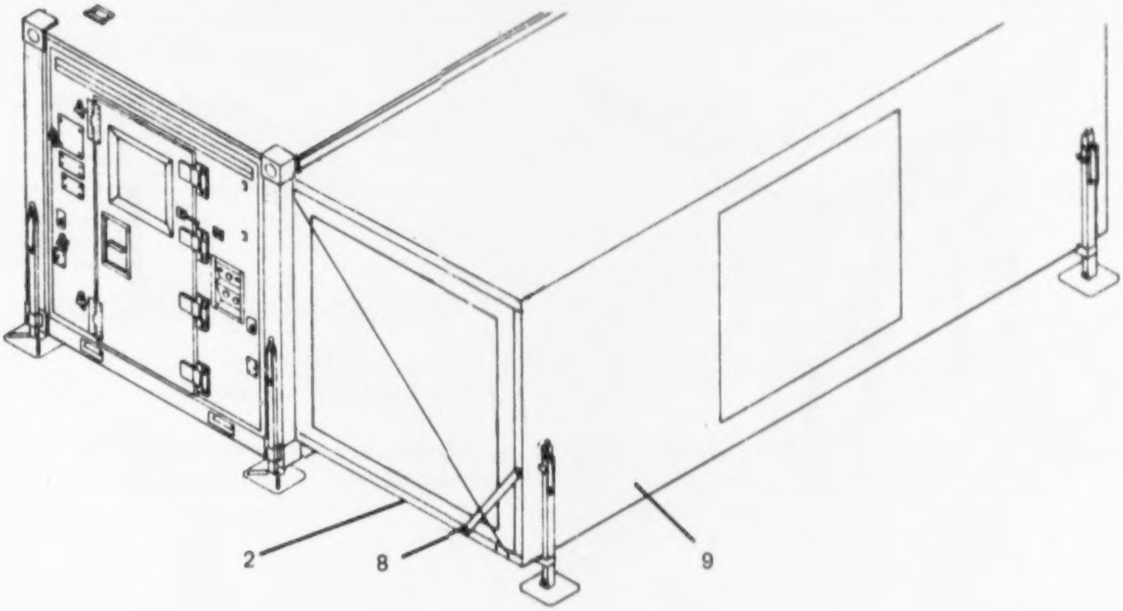
1. Position jack extension (11) in base (14) and secure by installing pin (13).

2. Position jack assembly (12) on jack extension (11) and secure by installing two quick-disconnect pins (10) through tubes of jack extension and jack assembly.

3-10. (cont)

Support Braces

Install support brace (8) in hinged sidewall (9) and hinged floor panel (2) by pushing straight in engaging pins on brace in holes on panels.



Storm Configuration Components

Refer to paragraph 2-21 for installation of storm configuration components.

CHAPTER 4

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

4-1. COMMON TOOLS AND EQUIPMENT.

a. Appendix B, Section III contains the authorized common tools.

b. For authorized equipment refer to Modified Table of Organization and Equipment (MTOE) applicable to your unit.

4-2. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT.

a. A special tool, hand blind riveter, Appendix B, Item 2 is used for shelter skin repair and general riveting utilizing blind rivets.

b. Installation tools, Appendix B, Items 3 and 9 are used for installation of captive screws.

c. Portable electric router, Appendix B, Item 15 is used to cut out panels. Use tripod base heat lamp, Appendix B, Item 16 during panel repair.

d. Snap ring pliers, Appendix B, Item 10, is used to remove and install retaining rings on closeout panels.

e. Fastener header, Appendix B, Item 7 or 8 and box end or adjustable wrench, Appendix B, Item 11 are used to install non-potted inserts.

f. Multimeter, Appendix B, Item 4, is used to perform all continuity/voltage tests on shelter. Electric tool kit, Appendix B, Item 5 is used to repair wiring.

g. Use portable electric drill, Appendix B, Item 6 to drive hinge pins.

h. Blind bolt removal tool kit, Appendix B, Item 13, is used to remove rivets on hinge edge members of floor panel.

i. Installation tool, Appendix B, Item 14 is used to install rivets on hinge edge members of floor panel.

j. Use crimping tool, Appendix B, Item 12, to attach wires to receptacle pins on power entry panel.

4-3. REPAIR PARTS. Repair parts covering organizational maintenance for this shelter are listed and illustrated in TM 10-5411-201-24P.

Section II. TROUBLESHOOTING PROCEDURES

4-4. GENERAL. This Section contains organizational troubleshooting information for locating and correcting common malfunctions which may develop in shelter electrical system.

WARNING

The shelter contains voltages that are dangerous if contacted. Take appropriate precautions when troubleshooting. Before performing continuity checks or replacing electrical components, make sure that electrical power is disconnected from circuit involved.

4-5. TROUBLESHOOTING. Each malfunction for an individual component or unit is listed in paragraph 4-6. The malfunction is followed by a list of tests or inspections which help to determine probable causes and corrective actions to take. The tests or inspections and corrective actions are to be performed in the order listed in the table. All malfunctions that may occur and all tests or inspections and corrective actions may not be listed. If a malfunction is not listed or is not corrected by corrective action, notify your supervisor. Unless otherwise noted, when troubleshooting operation of shelter electrical system, all switches and circuit breakers shall be placed in operating positions with power connected. The electrical system schematic diagram (4-46) and wire list (4-47) are located at the end of Chapter 4, Section III.

4-6. ORGANIZATIONAL MAINTENANCE TROUBLESHOOTING

MALFUNCTION
    TEST OR INSPECTION
        CORRECTIVE ACTION

---

1. NO POWER DISTRIBUTION TO SHELTER.

Step 1. Check that outside power is properly connected to service entrance on power entry panel, check general condition of cable and connectors. Test operation of power entry panel.

a. Replace defective wiring (paragraph 4-8).

b. Replace defective connectors (paragraph 4-8).

Step 2. Test operation of main circuit breaker and wiring (paragraph 4-7).

a. Replace defective wiring (paragraph 4-7).

b. Replace defective circuit breaker (paragraph 4-7).

4-6. (cont)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

---

2. INCANDESCENT LIGHT FAILS TO COME ON.

Step 1. Check visually for burned out bulb.

Replace bulb (paragraph 4-10).

Step 2. Test operation of incandescent light switch (S3), blackout override switch (S1) and wiring (paragraph 4-10).

a. Replace defective wiring (paragraph 4-10).

b. Replace defective switch (paragraph 4-10).

Step 3. Check and reset circuit breaker CB6.

Replace defective circuit breaker (paragraph 4-7).

3. ALL FLUORESCENT LIGHTS FAIL TO COME ON.

Step 1. Check and reset circuit breaker CB6.

Replace defective circuit breaker (paragraph 4-7).

Step 2. Test operation of fluorescent light switch (S4), blackout override switch (S1), and wiring (paragraph 4-7).

a. Replace defective wiring (paragraph 4-7).

b. Replace defective switch (paragraph 4-7).

4. ONE OR MORE FLUORESCENT LIGHTS IN THE EXPANDED SECTION FAIL TO COME ON.

Step 1. Check visually for burned out fluorescent lamps.

Replace lamp, (paragraph 4-12).

Step 2. Check associated flexible cable connectors for proper connection or defects.

Make proper connection or replace damaged connector or flexible cable (paragraph 4-11).

Step 3. Test operation of fluorescent light fixture and wiring (paragraph 4-11).

a. Replace defective wiring (paragraph 4-11).

b. Replace defective light fixture (paragraph 3-5).

4-6. (cont)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

5. ONE OR MORE FLUORESCENT LIGHTS IN THE FIXED SECTION FAIL TO COME ON.

Step 1. Check visually for burned out fluorescent lamps.

Replace lamp, (paragraph 4-12).

Step 2. Test operation of fluorescent light fixture and wiring (paragraph 4-12).

a. Replace defective wiring (paragraph 4-12).

b. Replace defective light fixture (paragraph 4-12).

WARNING

In the event of lamp breakage, care must be taken in removal of broken glass fragments and white phosphorous dust that may be dispersed within fixture. Inhalation of phosphorous dust could cause dangerous injury.

6. NO POWER AT ONE OR MORE UTILITY OUTLETS IN THE EXPANDED SECTION.

Step 1. Check and reset associated circuit breaker CB3, CB5, CB7.

Replace defective circuit breaker (paragraph 4-7).

Step 2. Test operation of utility outlet and wiring (paragraph 4-13).

a. Replace defective wiring (paragraph 4-13).

b. Replace defective outlet (paragraph 4-13).

7. NO POWER AT ECU SUPPLY CONNECTOR.

Step 1. Check and reset circuit breaker CB1.

Replace defective circuit breaker (paragraph 4-7).

Step 2. Test operation of connector and wiring (paragraph 4-8).

a. Replace defective wiring (paragraph 4-8).

b. Replace defective connector (paragraph 4-8).

4-6. (cont)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

---

8. NO POWER AT ONE OR BOTH EXTERIOR UTILITY OUTLETS.

Step 1. Check and reset circuit breaker CB8.

Replace defective circuit breaker (paragraph 4-7).

Step 2. Test operation of associated exterior utility outlet and wiring (paragraph 4-13).

a. Replace defective wiring (paragraph 4-13).

b. Replace defective outlet (paragraph 4-13).

Section III. ORGANIZATIONAL MAINTENANCE PROCEDURES

This section contains the following maintenance procedures for the shelter.

LIST OF FUNCTIONS

Function No.	Function	Function Ref. (paragraph)
1	Circuit Breaker Panel Assembly Testing, Replacement and Repair	4-7
2	Power Entry Panel Assembly Testing, Replacement and Repair	4-8
3	Area Light Assembly Testing and Repair	4-9
4	Incandescent Light Assembly Testing, Replacement and Repair	4-10
5	Hinged Roof Area Ceiling Light Testing and Repair	4-11
6	Fixed Roof Area Ceiling Light Testing, Replacement and Repair	4-12
7	Receptacle Outlets Testing, Replacement, and Repair	4-13
8	Wall Switches Replacement	4-14
9	Blackout Switch Replacement, Repair, and Adjustment	4-15
10	Wiring Testing, Replacement, and Repair	4-16
11	Personnel and Right Cargo Door Replacement, Repair, and Alignment	4-17
12	Left Cargo Door Replacement, Repair, and Alignment	4-18
13	Hinged Panel Leveling Jack Assemblies Service and Repair	4-19
14	Hinged Roof Panel Service, Replacement, Repair, and Alignment	4-20
15	Hinged Endwall Replacement and Repair	4-21

LIST OF FUNCTIONS (CONT)

Function No.	Function	Function Ref. (paragraph)
16	Hinged Sidewall Replacement and Repair	4-22
17	Hinged Floor Panel Replacement and Repair	4-23
18	Container Lift Jack Assemblies Service and Repair	4-24
19	Personnel Door End Endwall Panel Replacement and Repair	4-25
20	Cargo Door End Endwall Panel Replacement and Repair	4-26
21	Sidewall Panel Replacement and Repair	4-27
22	Roof Panel Assembly Repair	4-28
23	Floor Panel Repair	4-29
24	Camlock and Latch Cam Handle Replacement and Repair	4-30
25	Equipment Container Replacement and Repair	4-31
26	Drying Water-Soaked Areas In Panels	4-32
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4-7. CIRCUIT BREAKER PANEL ASSEMBLY TESTING, REPLACEMENT, AND REPAIR

This task covers:

a. Testing
b. Removal
c. Cleaning, Inspection
d. Repair
e. Installation

INITIAL SETUP

Standard Tools
General mechanics tool kit

Test Equipment
Multimeter, Appendix B, Item 4
Electrical tool kit, Appendix B, Item 5

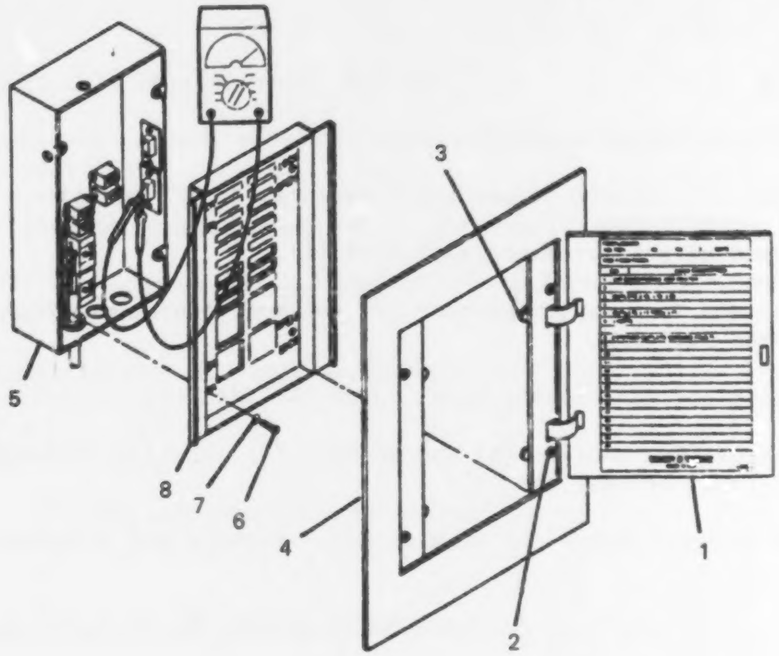
Personnel Required
Electrician

TESTING

1. Disconnect site power

2. Set all circuit breakers and switches to OFF position.

4-7. (cont)



3. Open circuit breaker panel door (1).

4. Loosen four captive screws (2) and move four clamp fingers (3) to OPEN position.

5. Lift circuit breaker panel cover (4) from circuit breaker box (5).

6. Remove four screws (6) and washers (7) and lift panelboard (8) from circuit breaker box (5).

7. Reconnect site power.

8. Set main circuit breaker to ON position.

9. Set branch circuit breakers to ON position and observe if any breakers pop to OFF position.

10. Disconnect site power.

11. Using multimeter, check for continuity at circuit breakers, light switches, and wiring.

12. If no continuity is present, replace defective circuit breaker, light switch, or panel wiring. (Refer to paragraph 5-2)

4-7. (cont)

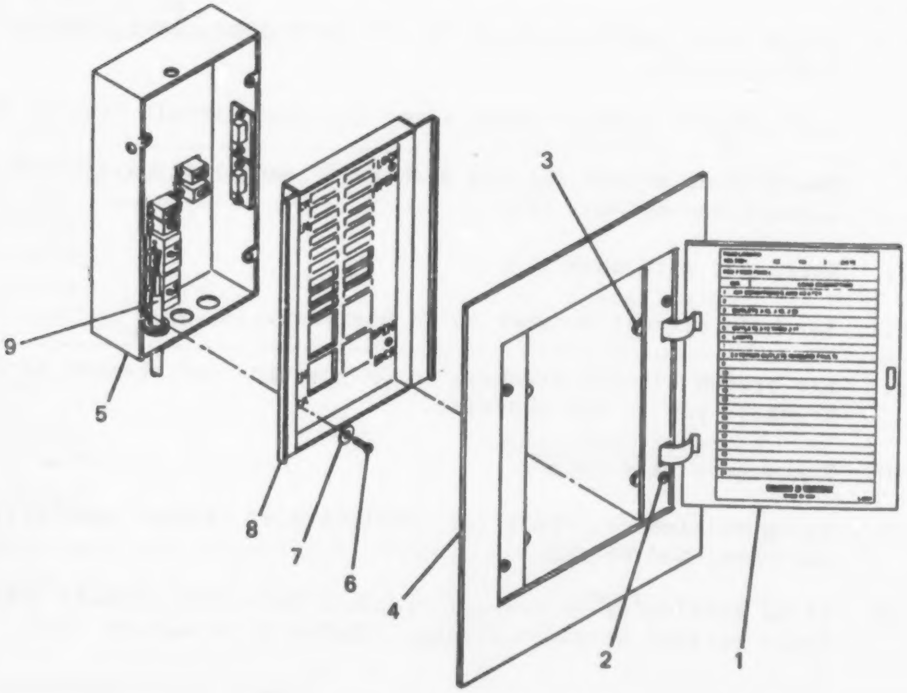
REMOVAL

Panel Wiring

1. Disconnect site power
2. Set all circuit breakers and switches to OFF position.
3. Open circuit breaker panel door (1).
4. Loosen four captive screws (2) and move four clamp fingers (3) to OPEN position.
5. Lift circuit breaker panel cover (4) from circuit breaker box (5).
6. Remove four screws (6) and washers (7) and lift panelboard (8) from circuit breaker box (5).
7. Disconnect wires (9) from circuit breakers and switches

NOTE

Tag all wires for reconnection.



4-7. (cont)

Light Switches

8. Open circuit breaker panel door (1).

9. Loosen four captive screws (2) and move four clamp fingers (3) to OPEN position.

10. Lift circuit breaker panel cover (4) from circuit breaker box (5).

11. Remove four screws (6) and washers (7) and lift panelboard (8) from circuit breaker box (5).

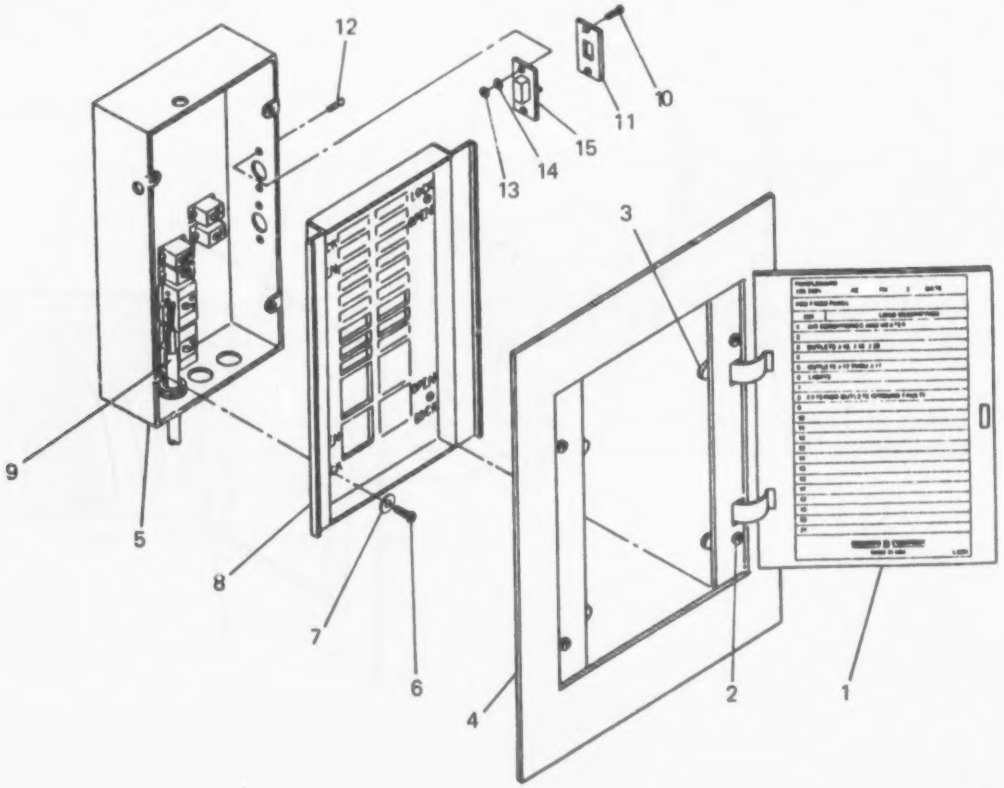
12. Disconnect wires (9) from light switches (15).

NOTE

Tag all wires for reconnection

13. Remove four screws (10) and two switch covers (11).

14. Remove four screws (12), nuts (13), and lockwashers (14), and remove two light switches (15) from circuit breaker box (5).



4-7. (cont)

Circuit Breakers

15. Open circuit breaker panel door (1).

16. Loosen four captive screws (2) and move four clamp fingers (3) to OPEN position.

17. Lift circuit breaker panel cover (4) from circuit breaker box (5).

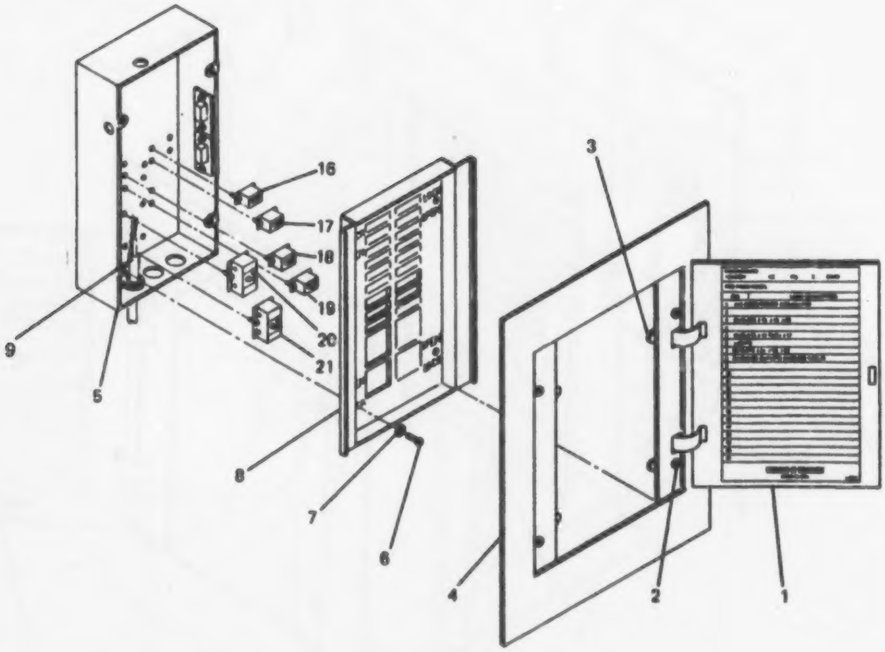
18. Remove four screws (6) and washers (7) and lift panelboard (8) from circuit breaker box (5).

19. Disconnect wires (9) from circuit breakers (16 through 21).

NOTE

Tag all wires for reconnection.

20. Remove circuit breakers (16 through 21) from circuit breaker box (5).



4-7. (cont)

CLEANING, INSPECTION

1. Clean circuit breaker panel and component surfaces.

NOTE

> Do not use water to clean circuit breaker panel assembly.

2. Inspect mounting surfaces for corrosion and damage.
3. Inspect for damaged circuit breakers or light switches.
4. Inspect panel wiring for cracks, tears, burns, or other damage.

REPAIR

1. Replace damaged circuit breakers or light switches.
2. Repair or replace damaged wiring.

INSTALLATION

Circuit Breakers

1. Install circuit breakers (16 through 21) in circuit breaker box (5).
2. Connect wires (9) to circuit breakers (16 through 21). (Refer to paragraph 4-47).
3. Position panelboard (8) over circuit breakers (16 through 22) in circuit breaker box (5) and secure with four screws (6) and washers (7).
4. Position circuit breaker panel cover (4) against circuit breaker box (5) and secure by moving four clamp fingers (3) to LOCK position and tightening four captive screws (2).
5. Close circuit breaker panel door (1).

4-7. (cont)

Light Switches

6. Position two light switches (15) in circuit breaker box (5) and secure with four screws (12), nuts (13), and lockwashers (14).

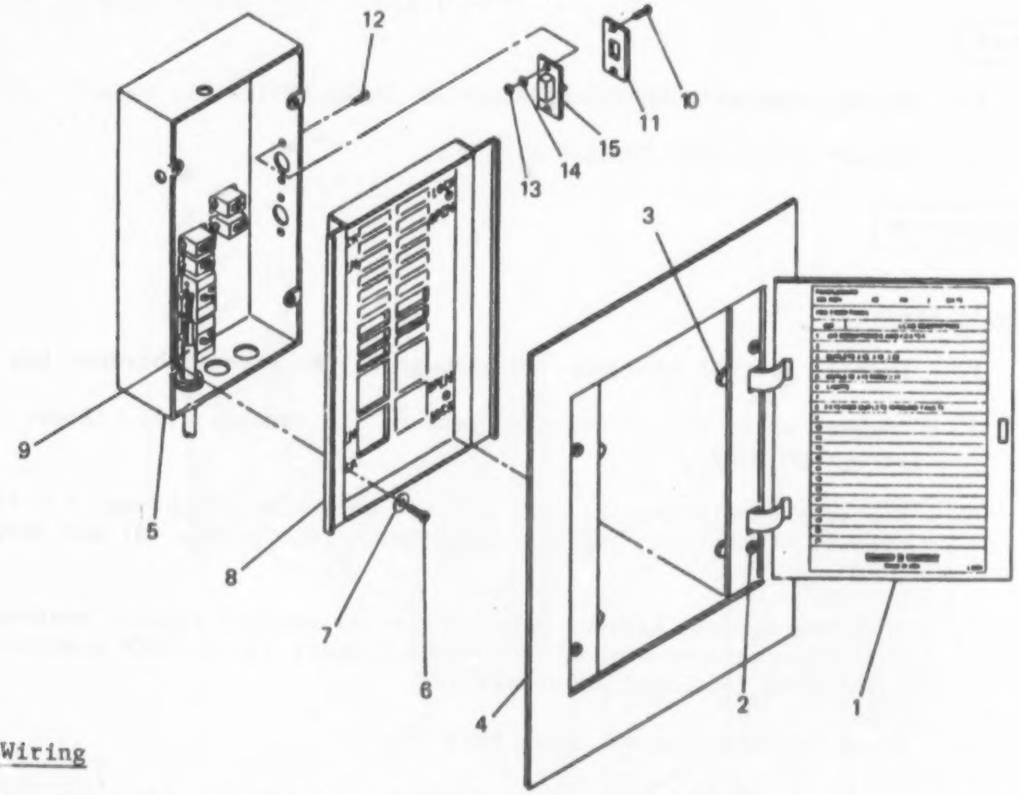
7. Position two switch covers (11) over light switches (15) and secure with four screws (10).

8. Connect wires (9) to light switches (15). (Refer to paragraph 4-47)

9. Position panelboard (8) over circuit breakers in circuit breaker box (3) and secure four screws (6) and washers (7).

10. Position circuit breaker panel cover (4) against circuit breaker box (5) and secure by moving four clamp fingers (3) to lock position and tightening four captive screws (2).

11. Close circuit breaker panel door (1).



Panel Wiring

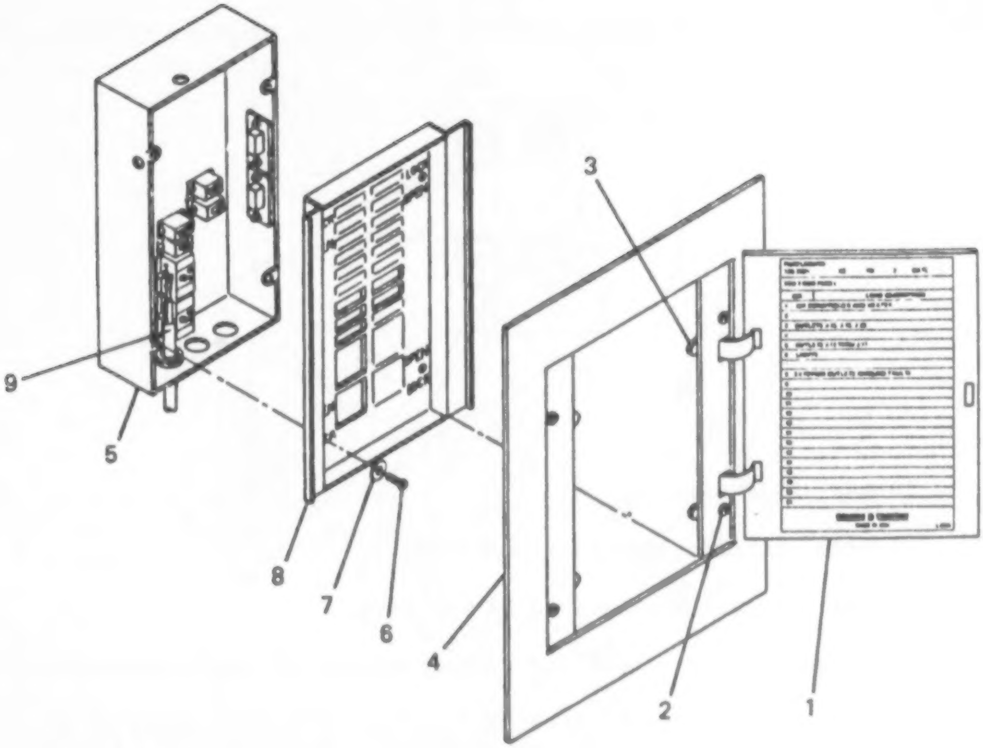
12. Connect wires (9) to circuit breakers and light switches. (Refer to paragraph 4-47)

4-7. (cont)

13. Position panelboard (8) over circuit breakers in circuit breaker box (3) and secure with four screws (6) and washers (7).

14. Position circuit breaker panel cover (4) against circuit breaker box (5) and secure by moving four clamp fingers (3) to lock position and tightening four captive screws (2).

15. Close circuit breaker panel door (1).



4-8. POWER ENTRY PANEL ASSEMBLY TESTING, REPLACEMENT, AND REPAIR

This task covers:

a. Testing	d. Repair
b. Removal	e. Installation
c. Cleaning, Inspection	

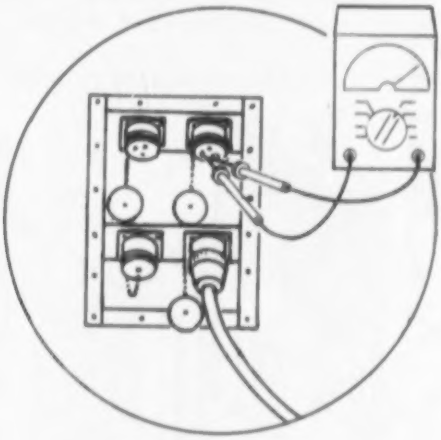
INITIAL SETUP

Standard Tools
General mechanics tool kit

Test Equipment
Multimeter, Appendix B, Item 4

Personnel Required
Electrician

TESTING



1. Connect site power.
2. Unscrew connector covers from connectors.
3. Set all circuit breakers in ON position.
4. Using multimeter, check for proper voltage at each receptacle pin.
5. If improper voltage is present, replace defective receptacles, terminals/connectors, or panel wiring. (Refer to paragraph 5-3).

REMOVAL

Receptacles

1. Inside shelter, remove screws (1), lockwashers (2) and washers (3), and carefully lift cover assembly (4) away from personnel door end endwall panel as far as it will go.
2. Disconnect wires (20) from receptacles (10, 11, 17, and 18) at back of panel (5).

4-8. (cont)

NOTE

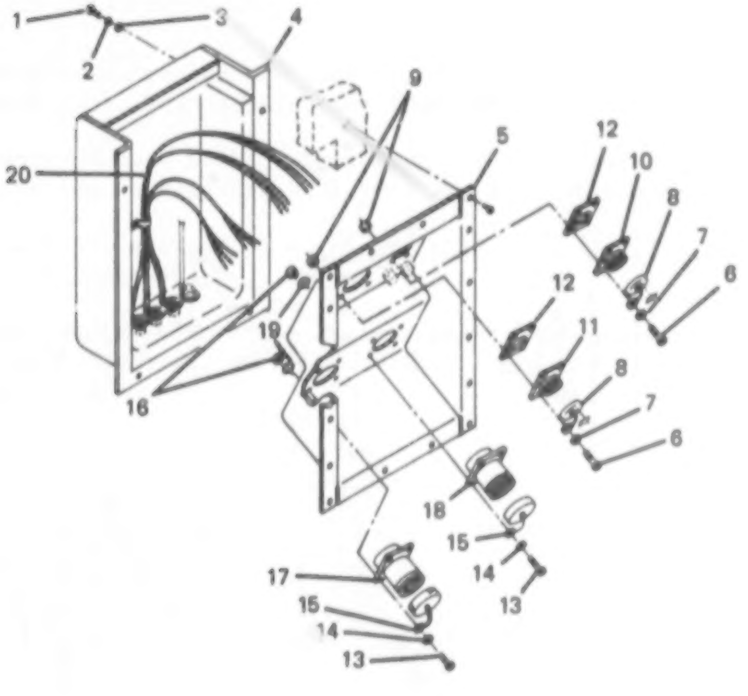
Tag all wires for reconnection.

3. Remove screws (6), lockwashers (7), receptacle covers (8), and nuts (9).

4. Remove receptacles (10 and 11) and gaskets (12) from panel (5).

5. Remove screws (13), lockwashers (14), receptacle covers (15), nuts (16), and washers (19).

6. Remove receptacles (17 and 18) from panel (5).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4-8. (cont)

Terminals/Connectors

7. Inside shelter, remove screws (1), lockwashers (2), and washers (3), and carefully lift cover assembly (4) away from personnel door end endwall panel as far as it will go.

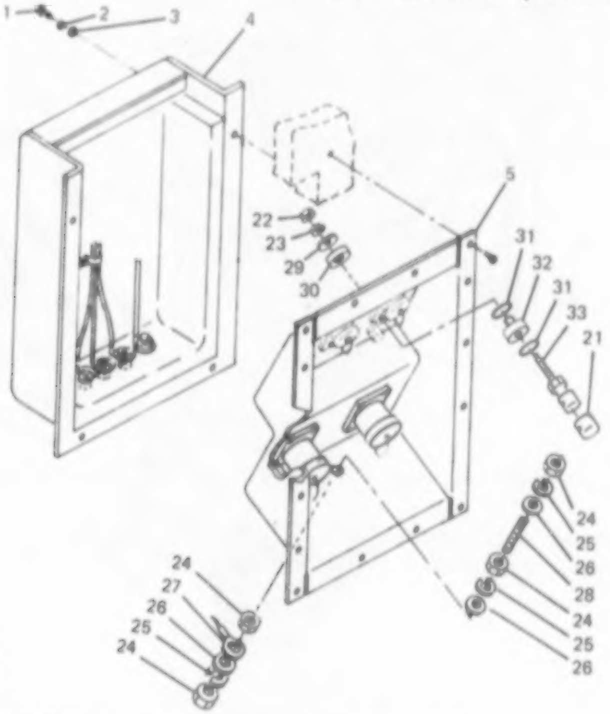
8. Disconnect wires from terminals/connectors at rear of panel (5).

NOTE

Tag all wires for reconnection.

9. Remove rubber cap (21), nut (22), lockwasher (23), brass washer (29), nylon washer (30), two O-rings (31), nylon washer (32), and binding post body (33) from panel (5).

10. Remove four nuts (24), three lockwashers (25), three washers (26), terminal lug (27), and threaded stud (28) from panel (5).



CLEANING, INSPECTION

1. Clean power entry panel and component surfaces.

2. Inspect mounting surfaces for corrosion and damage.

3. Inspect for damaged receptacles, binding posts, terminals, or threaded stud.

4-8. (cont)

REPAIR

Replace damaged receptacles, binding post, terminals, or threaded stud.

INSTALLATION

Terminals/Connectors

1. Install threaded stud (28), terminal lug (27), three washers (26), three lockwashers (25), and four nuts (24) in panel (5).

2. Install binding post body (33), nylon washer (32), two O-rings (31), nylon washer (30), brass washer (29), lockwasher (23), nut (22), and rubber cap (21) in panel (5).

3. Connect all wires to terminals/connectors at rear of panel (5). (Refer to paragraph 4-47)

4. Inside shelter, position cover assembly (4) against personnel door end endwall panel and secure with washers (3), lockwashers (2), and screws (1).

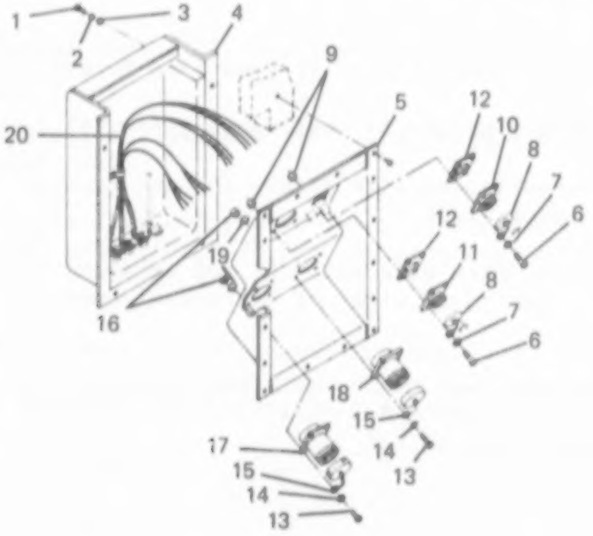
Receptacles

5. Install receptacles (17 and 18), nuts (16), washers (19), receptacle covers (15), lockwashers (14), and screws (13) in panel (5).

6. Install gaskets (12), receptacles (10 and 11), nuts (9), receptacle covers (8), lockwashers (7), and screws (6) in panel (5).

7. Connect all wires (20) to receptacles (10, 11, 17, and 18). (Refer to paragraph 4-47)

8. Inside shelter, position cover assembly (4) against personnel door end endwall panel and secure with washers (3), lockwashers (2), and screws (1).



4-9. AREA LIGHT ASSEMBLY TESTING AND REPAIR

This task covers:

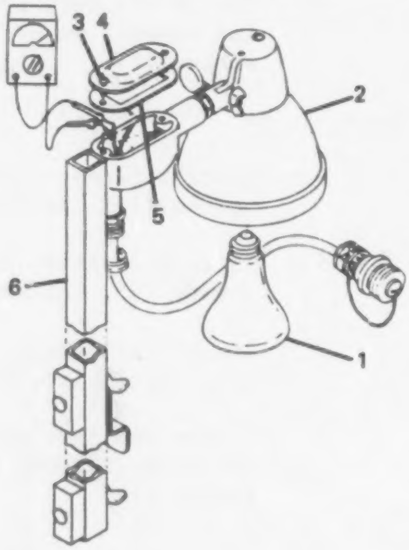
- a. Testing
- b. Disassembly
- c. Cleaning, Inspection
- d. Repair
- e. Assembly

INITIAL SETUP

Special Tools
Hand blind riveter, Appendix B, Item 2
Test Equipment
Multimeter, Appendix B, Item 4
Standard Tools
General mechanics tool kit

Personnel
Electrician
Sheet metal worker
Equipment Condition
Area light assembly removed (paragraph 3-4)
All circuit breakers and switches in OFF position

TESTING



1. Remove flood light (1) from lamp holder (2).
2. Unscrew two captive screws (3) and remove conduit outlet cover (4) and gasket (5) from exterior light post (6).
3. Using multimeter, check for continuity at lamp socket and wiring.
4. If no continuity is present, replace defective lamp or wiring.

DISASSEMBLY

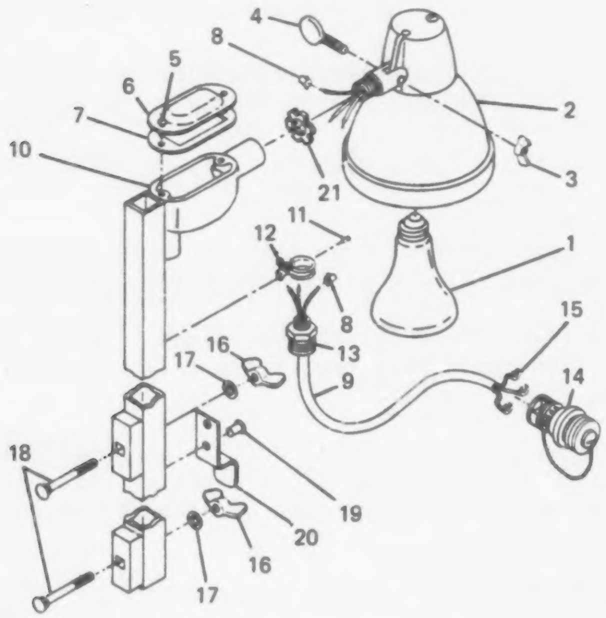
1. Unscrew flood light (1) from lamp holder (2).
2. Remove wing nut (3) and thumb screw (4) from lamp holder (2).
3. Unscrew two captive screws (5) and remove conduit outlet cover (6) and gasket (7).
4. Remove three wire nuts (8) and separate three wires in lamp holder (2) from three wires of electrical cord (9) in exterior light post (10).
5. Separate lamp holder (2) from exterior light post (10).
6. Remove locknut (21).

4-9. (cont)

7. Rotate screw on clamp (12) one-quarter turn, open clamp (12), and remove electrical cord (9).

8. Drill out two rivets (11) and remove clamp (12) from exterior light post (10). (Refer to 4-33)

9. Remove electrical cord (9) from exterior light post (10).



10. Separate liquid tight connector (13) and connector (14) from electrical cord (9).

11. Remove three terminal lugs (15) from three wires in electrical cord (9).

12. Remove two wing nuts (16), washers (17), and bolts (18) from exterior light post (10).

13. Drill out four rivets (19) and remove two cord stowage brackets (20) from exterior light post (10). (Refer to paragraph 4-33)

CLEANING, INSPECTION

1. Clean area light assembly and component surfaces.

2. Inspect mounting surfaces for corrosion and damage.

4-9. (cont)

3. Inspect for and replace if necessary:

   a. Missing or damaged components

   b. Corrosion or paint damage.

REPAIR

Repair corrosion or paint damage. (Refer to paragraph 4-44)

ASSEMBLY

1. Position two cord stowage brackets (20) on exterior light post (10) and install four rivets (19). (Refer to paragraph 4-33)

2. Install two bolts (18), washers (17), and wing nuts (16) in exterior light post (10).

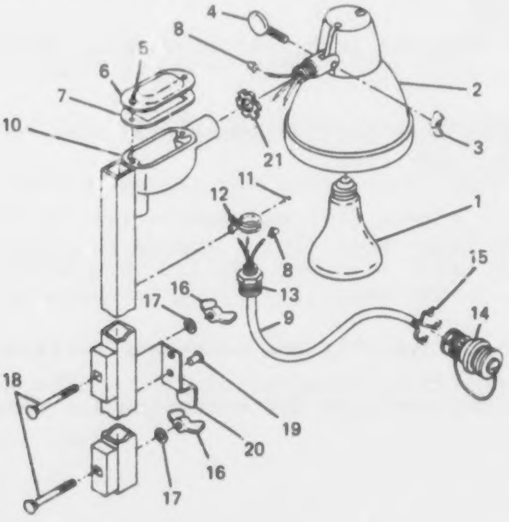
3. Assemble three terminal lugs (15) to three wires on one end of electrical cord (9) and attach connector (14) at that end.

4. Place electrical cord (9) through clamp (12) and attach clamp to exterior light post with two rivets (11) and close clamp. (Refer to paragraph 4-33)

5. Assemble liquid tight connector (13) to opposite end of electrical cord (9) and install assembly in exterior light post (10). Make sure three wires extend through opening at top of exterior light post (10).

6. Assemble locknut (21) on lamp holder (2).

7. Assemble lamp holder (2) to exterior light post (10) and install thumb screw (4) and wing nut (3). Make sure three wires extend through opening at top of exterior light post (10).



4-9. (cont)

8. Connect three wires from electrical cord (9) to three wires from lamp holder (2) as follows:

From Electrical Cord	To Lamp Holder
Black Wire	Black Wire
White Wire	White Wire
Green Wire	Bare Wire

9. Secure these wires with three wire nuts (8).

10. Make sure connected wires are positioned in opening at top of exterior light post (10) and assemble gasket (7) and outlet cover (6) to top of exterior light post (10) with two captive screws (5).

11. Install flood light (1) in lamp holder (2).

4-10. INCANDESCENT LIGHT ASSEMBLY TESTING, REPLACEMENT AND REPAIR

This task covers.

a. Testing
b. Removal
c. Cleaning, Inspection
d. Repair
e. Installation

INITIAL SETUP

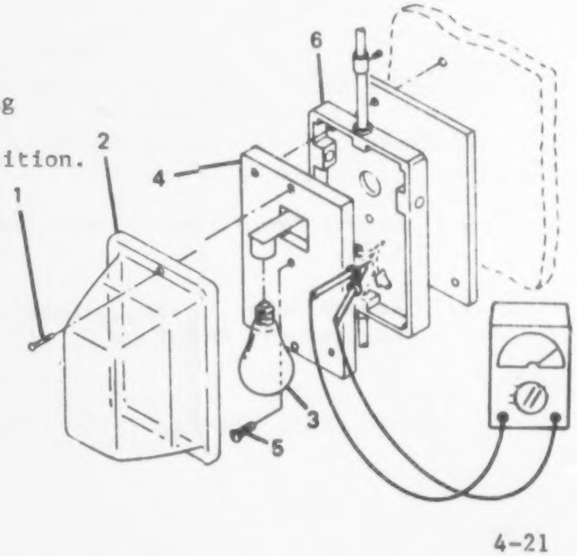
Standard Tools
General mechanics tool kit

Test Equipment
Multimeter, Appendix B, Item 4

Personnel
Electrician

WARNING

This fixture contains voltage that is dangerous if contacted. Before replacing incandescent light assembly, set all circuit breakers and switches to OFF position.



TESTING

1. Set all circuit breakers and switches to OFF position.

2. Remove two screws (1) and cover (2).

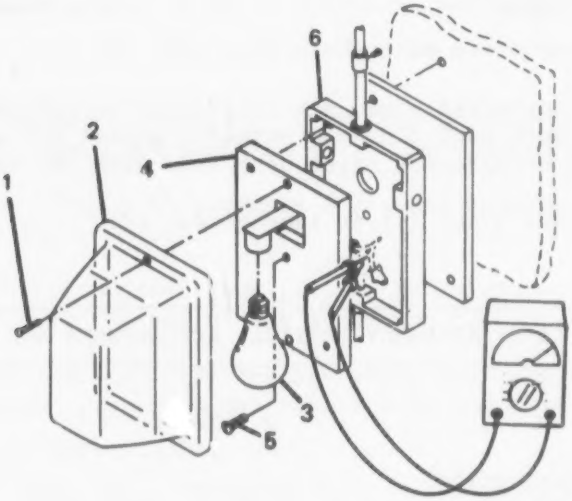
3. Unscrew bulb (3) from light fixture (4).

4-10. (cont)

4. Remove screw (5) and separate light fixture (4) from light fixture adapter (6) as far as it will go.

5. Using multimeter, check for continuity at bulb socket and wiring.

6. If no continuity is present, replace defective light fixture or wiring.



REMOVAL

1. Remove two screws (1) and switch cover (2).

2. Remove two screws (3) and pull switch (4) from outlet box (27) as far as it will go.

3. Disconnect wires at rear of switch (4).

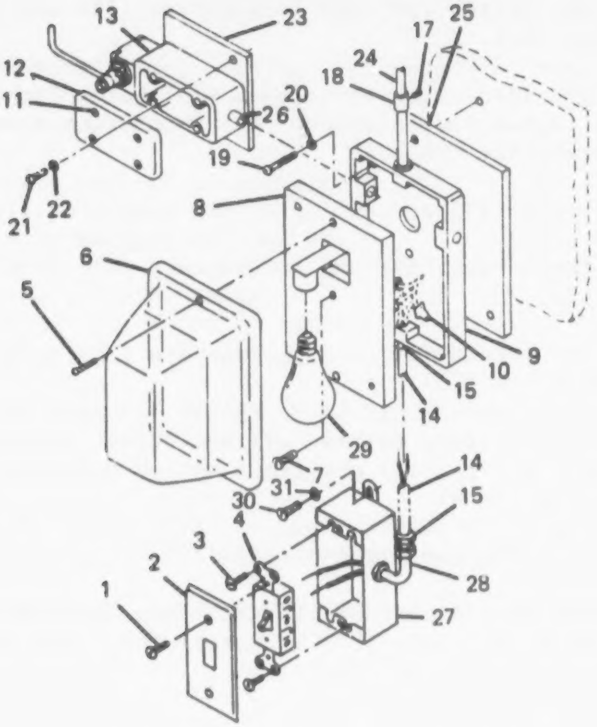
NOTE

Tag wires for reconnection.

4. Remove two screws (5) and light fixture cover (6). Remove bulb (29).

5. Remove screw (7) and separate light fixture (8) from light fixture adapter (9) as far as it will go.

4-10. (cont)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6. Remove wire nuts (10) and disconnect wires from rear of light fixture (8).

NOTE

Tag wires for reconnection.

7. Loosen four captive screws (11) and remove limit switch cover (12).

8. Disconnect three sets of wires plus one ground wire inside limit switch (13).

NOTE

Tag wires for reconnection.

9. Pull wires up through lower conduit (14) and into light fixture adapter (9).

4-10. (cont)

10. Remove two screws (30) and lockwashers (31) and separate outlet box (27) from wall.

11. Loosen two insulating connectors (15) below light fixture adapter (9) and remove lower conduit (14) from light fixture adapter (9) and elbow connector (28).

12. Loosen screw (17) at rear of offset connector (18).

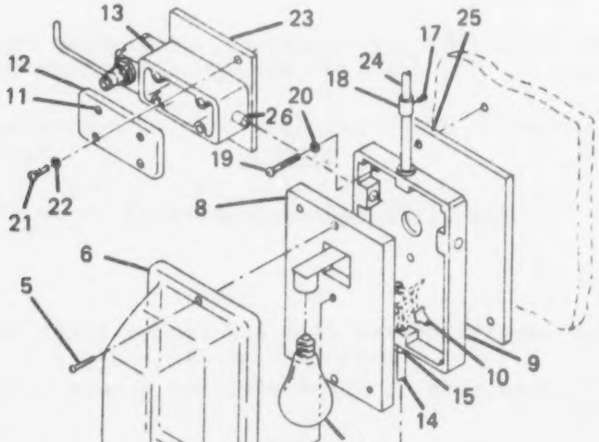
13. Remove two screws (19) and lockwashers (20) from light fixture adapter (9).

14. Remove two screws (21) and lockwashers (22) from limit switch mounting plate (23).

15. Lower light fixture adapter (9) and offset connector (18),together with limit switch (13) and limit switch mounting plate (23) from upper conduit (24).

16. Remove incandescent light spacer (25).

17. Separate light fixture adapter (9) from limit switch (13) and limit switch mounting plate (23) by unscrewing close nipple (26).



4-10. (cont)

CLEANING, INSPECTION

1. Clean incandescent light assembly and component systems.

2. Inspect mounting surfaces for corrosion and damage.

3. Inspect for and replace if necessary:

   a. Missing or damaged components.

   b. Corrosion or paint damage.

REPAIR

Corrosion or paint damage. (Refer to paragraph 4-44)

INSTALLATION

1. Assemble limit switch (13) to limit switch mounting plate (23) to light fixture adapter (9) using close nipple (26).

2. Pass wiring through close nipple (26) into limit switch (13).

3. Connect wiring. (Refer to paragraph 4-47)

4. Position limit switch cover (12) on limit switch (13) and tighten four captive screws (11).

5. Pass wiring from upper conduit (24) through offset connector (18) at top of light fixture adapter (9) and position limit switch mounting plate (23) and light fixture adapter (9) with incandescent light spacer (25) behind it against endwall panel.

6. Install two screws (21) and lockwashers (22) securing limit switch (13) and limit switch mounting plate (23) to endwall panel.

7. Install two screws (19) and lockwashers (20) securing light fixture adapter (9) and incandescent light spacer (25) to endwall panel.

8. Pull wiring down into light fixture adapter (9), position upper conduit (24) in hole at top of adapter, and tighten offset connector (18).

9. Tighten screw (17) at rear of offset connector (18).

10. Pass wiring for switch (4) through lower hole of light fixture adapter (9) and thread through lower conduit (14).

11. Position lower conduit (14) in hole at bottom of light fixture adapter (9) and tighten upper insulating connector (15).

4-10. (cont)

12. Pull wiring through elbow connector (28) and into outlet box (27).

13. Position lower conduit (14) in elbow connector (28) and tighten lower insulating connector (15).

14. Position outlet box (27) against wall and secure with two screws (30) and lockwashers (31).

15. Position switch (4) near outlet box (27) and connect wires. (Refer to paragraph 4-47)

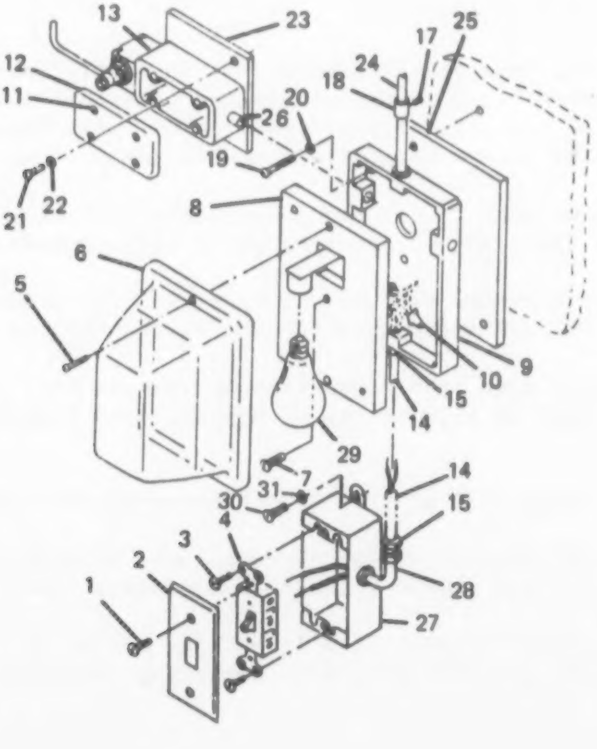
16. Position switch (4) in outlet box (27) and secure with two screws (3).

17. Position switch cover (2) on switch (4) and secure with two screws (1).

18. Position light fixture (8) near light fixture adapter (9) and connect wires. (Refer to paragraph 4-47)

19. Position light fixture (8) on light fixture adapter (9) and secure with one screw (7). Install bulb (29).

20. Position light fixture cover (6) on light fixture (8) and secure with two screws (5).



4-11. HINGED ROOF AREA CEILING LIGHT TESTING AND REPAIR

This task covers:

- a. Testing
- b. Disassembly
- c. Cleaning, Inspection
- d. Repair
- e. Assembly

INITIAL SETUP

Special Tools
Hand blind riveter, Appendix B, Item 2
Test Equipment
Multimeter, Appendix B, Item 4
Standard Tools
General mechanics tool kit

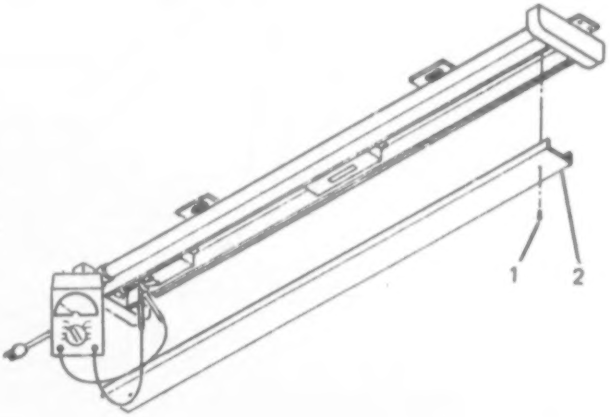
Personnel
Electrician
Equipment Condition
Hinged roof area ceiling light removed (paragraph 3-5)
All circuit breakers and switches in OFF position

TESTING

WARNING

In the event of lamp breakage, care must be taken in the removal of broken glass fragments and white phosphorus dust that may be dispersed within the fixture. Inhalation of phosphorus dust could cause dangerous injury. Set all circuit breakers and switches to OFF position.

1. Remove three screws (1) and cover (2).
2. Using multimeter, check for continuity at fluorescent lamps, light filter, ballast and electrical cord.
3. If no continuity is present, replace defective fluorescent lamp, light filter, ballast, or electrical cord.



4-11. (cont)

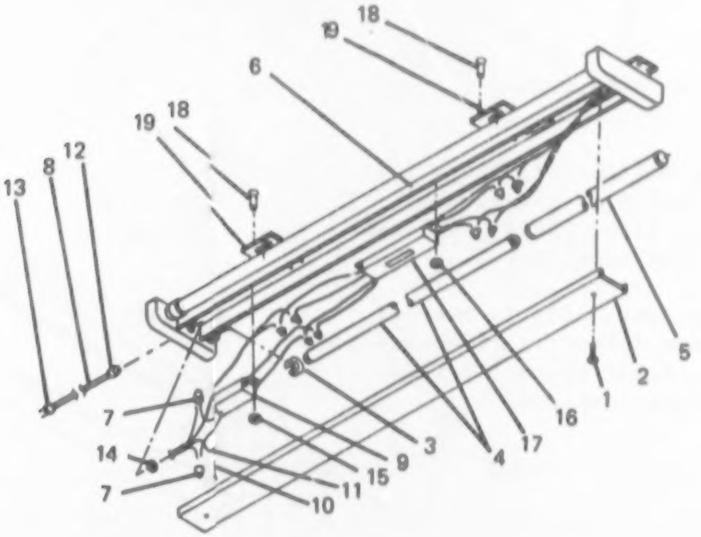
DISASSEMBLY

1. Remove screws (1) and cover (2) from light frame (6).

CAUTION

When removing end caps, hold safety tube level to prevent fluorescent tube from accidentally sliding out and dropping.

2. Remove split retaining rings (3) from one end of fluorescent lamps (4).
3. Remove two fluorescent lamps (4) with light shields (5) by rotating and sliding out of light frame (6). Remove light shields (5) from fluorescent lamps (4).
4. Remove two wire nuts (7) and separate two sets of wires between electrical cord (8) and light filter (9).
5. Remove two wire nuts (7) and separate two sets of wires between light filter (9) and ballast (17).
6. Remove two wire nuts (7) and separate two sets of wires between ballast (17) and contacts on light frame (6).



4-11. (cont)

7. Remove four wire nuts (7) and separate four sets of wires between ballast (17) and contacts at opposite end of light frame (6).

NOTE

Tag all wires for reconnection.

8. Remove installation screw (10) attaching terminal lug (11) on third wire from electrical cord (8) to light filter (9).

9. Remove locknut (14) and remove electrical cord (8) with liquid tight connector (12) and plug (13) from light frame (6).

10. Separate liquid tight connector (12) and plug (13) from electrical cord (8).

11. Remove nuts (15) and remove light filter (9) from light frame (6).

12. Remove nuts (16) and remove ballast (17) from light frame (6).

13. Drill out rivets (18) and remove two light support plates (19) from light frame (6). (Refer to paragraph 4-33)

CLEANING, INSPECTION

1. Clean hinged roof area ceiling light and component surfaces.

NOTE

Do not use water to clean hinged roof area ceiling lights.

2. Inspect mounting surfaces for corrosion and damage.

3. Inspect for and replace if necessary:

   a. Missing or damaged components.

   b. Corrosion or paint damage.

REPAIR

Repair corrosion or paint damage. (Refer to paragraph 4-44)

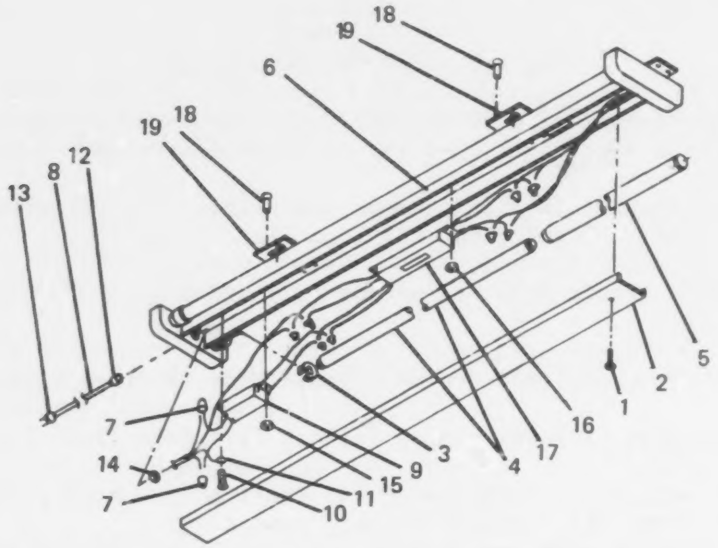
ASSEMBLY

1. Position two light support plates (19) on light frame (6) and install rivets (18). (Refer to paragraph 4-33)

4-11. (cont)

2. Position ballast (17) in light frame (6) and secure with nuts (16).

3. Position light filter (9) in light frame (6) and secure with nuts (15).



4. Assemble liquid tight connector (12) and plug (13) on opposite ends of electrical cord (8).

5. Install electrical cord (8) in light frame (6) and secure with locknut (14).

6. Attach terminal lug (11) on the end of the green wire of electrical cord (8) and secure the lug to light filter (9) with installation screw (10).

7. Connect the other two wires from electrical cord (8) to the two wires from light filter (9) as follows:

   Black to Black
   White to Yellow/Green

8. Connect two wires from light filter (9) to two wires from ballast (17) as follows:

   Black to Black
   Yellow to White

9. Connect two wires from ballast (17) to contacts on light frame (6) as follows:

   Yellow to Yellow
   Yellow to Black

4-11. (cont)

10. Connect four wires from ballast (17) to contacts at opposite end of light frame (6) as follows:

    Red to Black
    Red to Black
    Blue to White
    Blue to White

11. Secure all wires with wire nuts (7).

12. Assemble light shields (5) on fluorescent lamps (4) and install in light frame (6) by sliding in and rotating.

13. Install split retaining rings (3).

14. Attach cover (2) to light frame (6) with screws (1).

4-12. FIXED ROOF AREA CEILING LIGHT TESTING, REPLACEMENT, AND REPAIR

This task covers:
- a. Testing
- b. Removal
- c. Disassembly
- d. Cleaning, Inspection
- e. Repair
- f. Assembly
- g. Installation

INITIAL SETUP

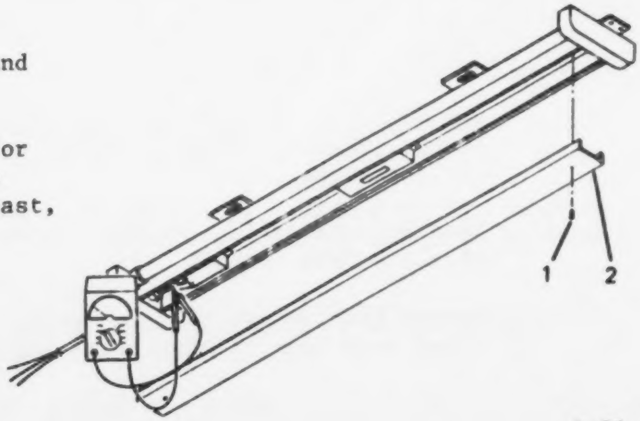
Special Tools
  Hand blind riveter, Appendix B, Item 2
Test Equipment
  Multimeter, Appendix B, Item 4
Standard Tools
  General mechanics tool kit

Personnel
  Electrician
Equipment Condition
  All circuit breakers and switches in OFF position

TESTING

1. Remove three screws (1) and cover (2).

2. Using multimeter, check for continuity of fluorescent lamps, light filter, ballast, and wiring.



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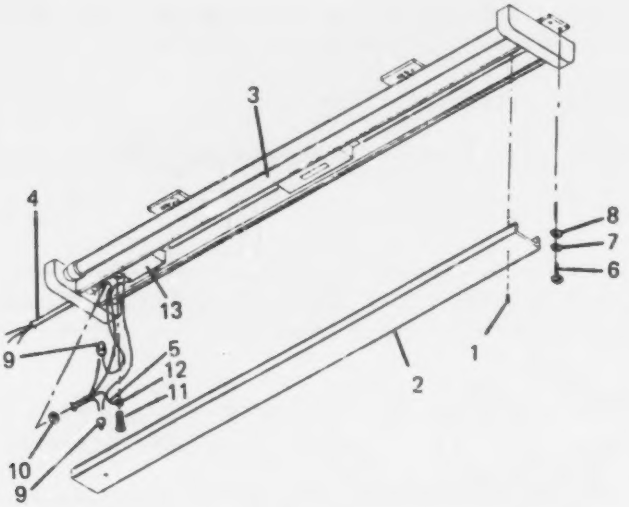
4-12. (cont)

3. If no continuity is present, replace defective fluorescent lamp, light filter, ballast, or wiring.

WARNING

This fixture contains voltage that is dangerous if contacted. Before replacing fixed roof area ceiling light, set all circuit breakers and switches to OFF position.

REMOVAL



1. Remove three screws (1) and cover (2) from fixed roof area ceiling light (3).

2. Remove wire nuts (9) and disconnect wires from light filter (13) in fixed roof area ceiling light (3).

NOTE

Tag wires for reconnection.

3. Loosen locknut (10) and separate conduit (4) from fixed roof area ceiling light (3).

4. Remove installation screw (11) attaching terminal lug (12) on third wire (5) from conduit (4).

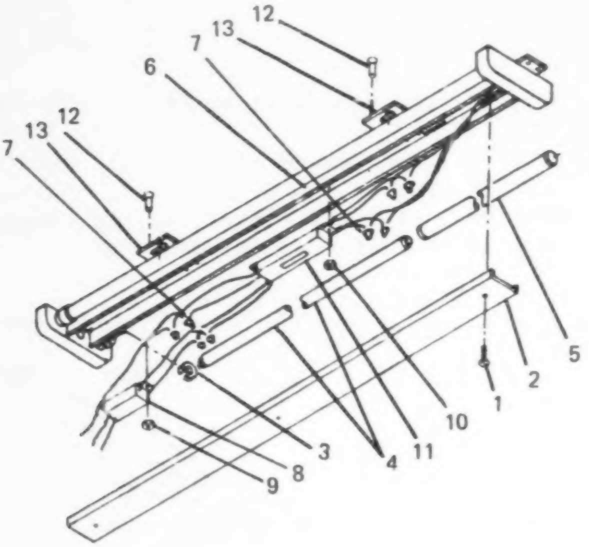
5. Remove four screws (6), lockwashers (7), and washers (8), and remove fixed roof area ceiling light (3) from fixed roof.

4-12. (cont)

WARNING

In the event of lamp breakage, care must be taken in the removal of broken glass fragments and white phosphorus dust that may be dispersed within the fixture. Inhalation of phosphorus dust could cause dangerous injury.

DISASSEMBLY



1. Remove screws (1) and cover (2) from light frame (6).

CAUTION

When removing end caps, hold safety tube level to prevent fluorescent tube from accidentally sliding out and dropping.

2. Remove split retaining rings (3) from one end of fluorescent lamps (4).

3. Remove two fluorescent lamps (4) with light shields (5) by rotating and sliding out of light frame (6). Remove light shields (5) from fluorescent lamps (4).

4. Remove two wire nuts (7) and separate two sets of wires between light filter (8) and ballast (11).

4-12. (cont)

5. Remove two wire nuts (7) and separate two sets of wires between ballast (11) and contacts on light frame (6).

6. Remove four wire nuts (7) and separate four sets of wires between ballast (11) and contacts at opposite end of light frame (6).

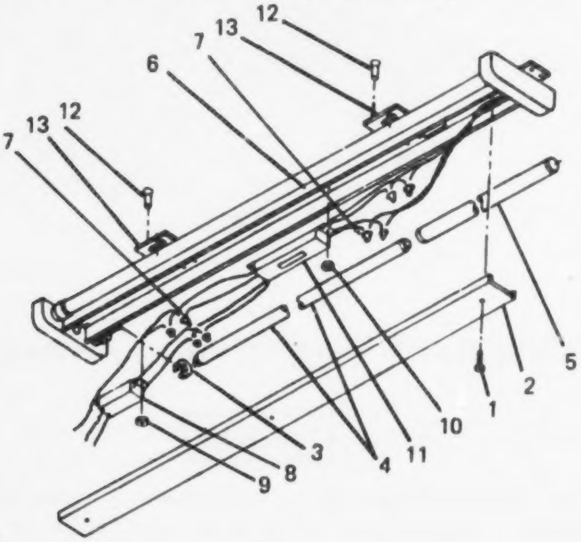
NOTE

Tag all wires for reconnection

7. Remove nuts (9) and remove light filter (8) from light frame (6).

8. Remove nuts (10) and remove ballast (11) from light frame (6).

9. Drill out rivets (12) and remove two light support plates (13) from light frame (6). (Refer to paragraph 4-33)



CLEANING, INSPECTION

1. Clean hinged roof area ceiling light and component surfaces.

2. Inspect mounting surfaces for corrosion and damage.

3. Inspect for and replace if necessary:

   a. Missing or damaged components.

   b. Corrosion or paint damage.

4-12. (cont)

REPAIR

Repair corrosion or paint damage. (Refer to paragraph 4-44)

ASSEMBLY

1. Position two light support plates (13) on light frame (6) and install rivets (12). (Refer to paragraph 4-33)
2. Position ballast (11) in light frame (6) and secure with nuts (10).
3. Position light filter (8) in light frame (6) and secure with nuts (9).
4. Connect two wires from light filter (8) to two wires from ballast (11) as follows:

   Black to Black
   Yellow to White

5. Connect two wires from ballast (11) to contacts on light frame (6) as follows:

   Yellow to Yellow
   Yellow to Black

6. Connect four wires from ballast (11) to contacts at opposite end of light frame (6) as follows:

   Red to Black
   Red to Black
   Blue to White
   Blue to White

7. Secure all wires with wire nuts (7).
8. Assemble light shields (5) on fluorescent lamps (4) and install in light frame (6) by sliding in and rotating.
9. Install split retaining rings (3).
10. Attach cover (2) to light frame (6) with screws (1).

4-12. (cont)

INSTALLATION

1. Position fixed roof area ceiling light (3) against fixed roof and install washers (8), lockwashers (7), and screws (6).

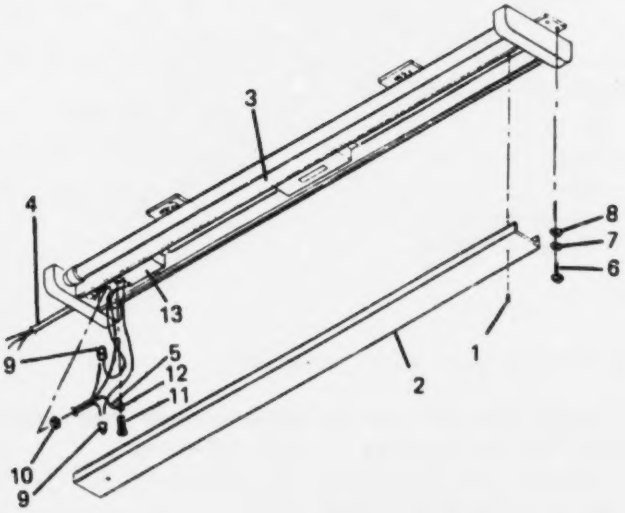
2. Pull wires from conduit (4) into fixed roof area ceiling light (3) and connect two wires to two wires from light filter (13) as follows:

   Black to Black
   White to Yellow/Green

3. Attach terminal lug (12) on end of green wire to fixed roof area ceiling light (3) with installation screw (11).

4. Attach conduit (4) to fixed area ceiling light (3) with locknut (10).

5. Attach cover (2) to fixed roof area ceiling light (3) with screws (1).



4-13. RECEPTACLE OUTLETS TESTING, REPLACEMENT, AND REPAIR

This task covers:

- a. Testing
- b. Removal
- c. Disassembly
- d. Cleaning, Inspection
- e. Repair
- f. Assembly
- g. Installation

INITIAL SETUP

Special Tools
Installation tool, Appendix B, Item 9
Electrical tool kit, Appendix B, Item 5

Standard Tools
General mechanics tool kit

Test Equipment
Multimeter, Appendix B, Item 4

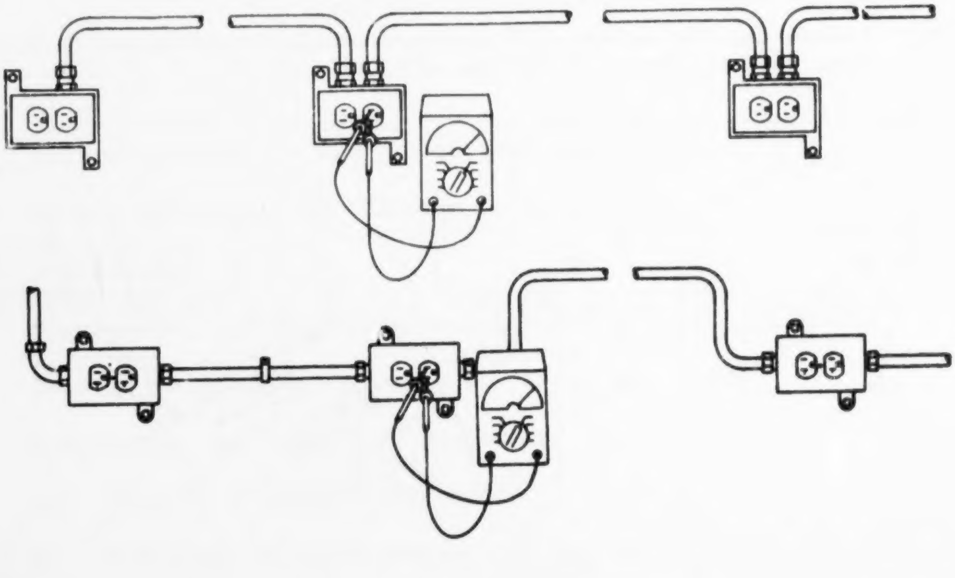
Personnel
Electrician
Sheet metal worker

WARNING

Remove all electrical power from circuits before removing cable and receptacle assemblies.

TESTING

1. Set all circuit breakers to OFF position.
2. Using multimeter, check for continuity in cable, conduit, and receptacle assemblies.



4-13. (cont)

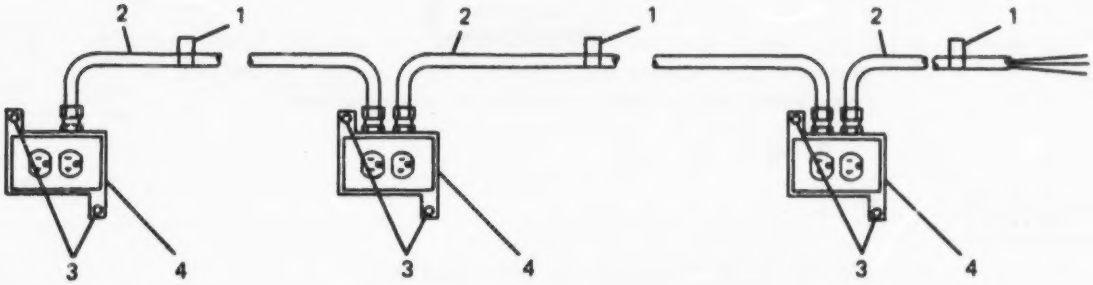
REMOVAL

1. Open velcro straps (1) securing electrical cords (2) to walls.
2. Disconnect wires from cable and receptacle assemblies at circuit breakers CB3, CB5, and CB7. (Refer to paragraph 4-46) and 4-47)

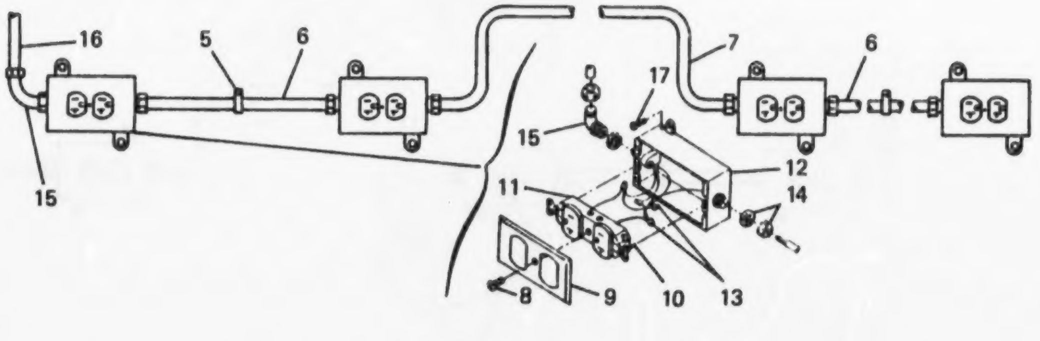
NOTE

Tag wires for reconnection

3. Using screwdriver, back out two captive screws (3) on each junction box assembly (4) and remove cable and receptacle assemblies from walls.



4. Open straps (5) securing conduit (6 and 7) to fixed sidewall.
5. Remove screws (8) and duplex receptacle covers (9).
6. Loosen captive screws (10) and move duplex receptacles (11) away from outlet boxes (12) as far as they will go.



4-13. (cont)

7. Remove wire nuts (13) and disconnect wires from rear of duplex receptacles (11).

NOTE

Tag wires for reconnection.

8. Disconnect connectors (14 and 15) and separate conduit (6, 7, and 16) from outlet boxes (12).

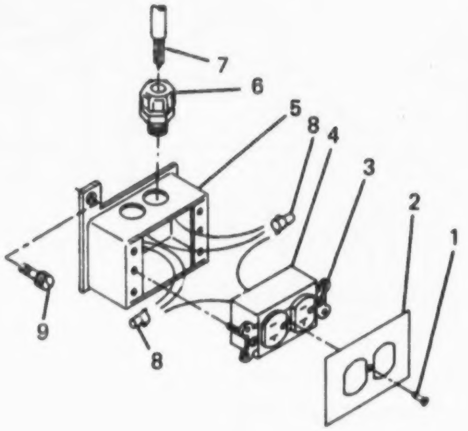
9. Remove screws (17) and outlet boxes (12) from fixed sidewall.

DISASSEMBLY

1. Remove screws (1) and duplex covers (2).

2. Loosen captive screws (3) and move duplex receptacles (4) away from junction boxes (5) as far as they will go.

3. Remove wire nuts (8) and terminals, and disconnect wires from rear of receptacles (4), where applicable.



NOTE

Tag wires for reconnection

4. Remove liquid tight connectors (6) from junction boxes (5) and separate connectors from electrical cords (7).

5. Remove captive screws (9) from junction boxes (5).

CLEANING, INSPECTION

1. Clean cable and receptacle assembly and component surfaces.

2. Inspect mounting surfaces for corrosion and damage.

3. Inspect for and replace if necessary:

   a. Missing or damaged components.

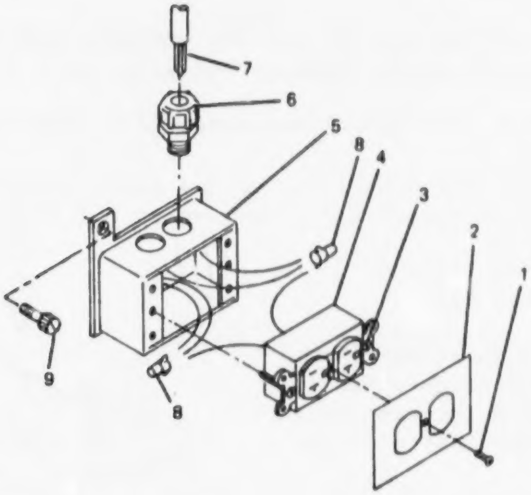
   b. Corrosion or paint damage.

4-13. (cont)

REPAIR

1. Repair or replace damaged wiring.
2. Corrosion or paint damage. (Refer to paragraph 4-43)

ASSEMBLY



1. Using installation tool, install captive screws (9) in junction boxes (5).
2. Assemble liquid tight connectors (6) on electrical cords (7).
3. Install liquid tight connectors (6) in junction boxes (5).
4. Connect wires to receptacles (4) and attach wire nuts (8) and terminals, where applicable. (Refer to paragraph 4-47)
5. Position receptacles (4) on junction boxes (5) and install screws (3).
6. Position covers (2) on duplex receptacles (4) and install screws (1).

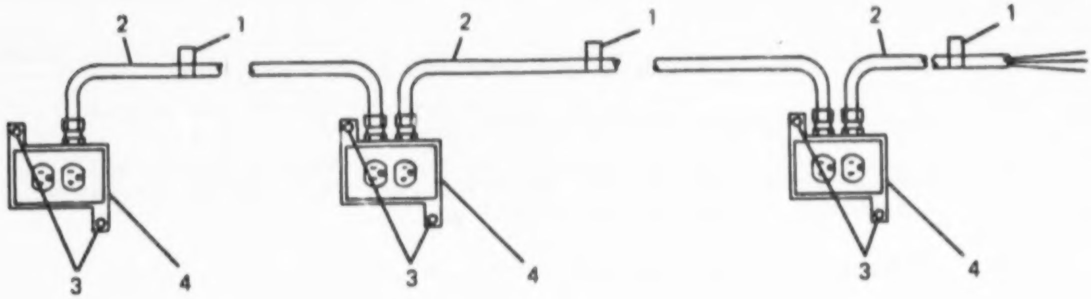
4-13. (cont)

INSTALLATION

1. Position cable and receptacle assemblies against walls with power cord facing up and secure junction box assemblies (4) by using screwdriver and tightening two captive screws (3) on each box.

2. Connect wires from cable and receptacle assemblies to circuit breakers CB3, CB5, and CB7. (Refer to paragraph 4-47)

3. Secure electrical cords (2) to walls with velcro straps (1).



4. Install outlet boxes (12) on fixed sidewall with screws (17).

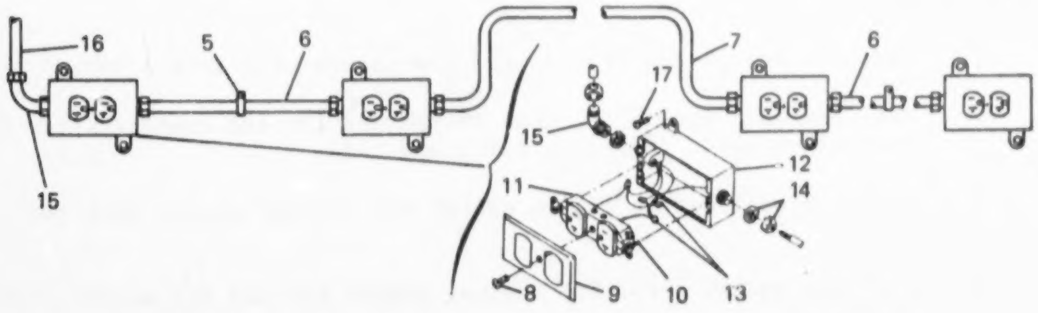
5. Install conduit (6, 7, and 16) in outlet boxes (12) with connectors 14 and 15).

6. Position duplex receptacles (11) near outlet boxes (12), connect wires, and secure with wire nuts (13). (Refer to paragraph 4-47)

7. Position duplex receptacles (11) on outlet boxes (12) and tighten captive screws (10).

8. Position duplex receptacle covers (9) on outlet boxes (12) and install screws (8).

9. Secure conduit (6 and 7) to fixed sidewall with straps (5).



4-14. WALL SWITCH REPLACEMENT

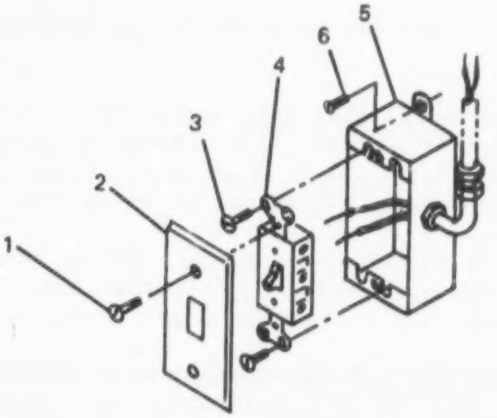
This task covers:
  a. Removal
  b. Installation

INITIAL SETUP

Standard Tools	Personnel
General mechanics tool kit	Electrician

REMOVAL

1. Set all circuit breakers and switches to OFF position.
2. Remove two screws (1) and switch cover (2).
3. Remove two screws (3) and carefully pull wall switch (4) out of switch box (5) as far as it will go.
4. Disconnect wires from wall switch (4).
5. Remove two screws (6) and remove switch box (5) from wall.



INSTALLATION

1. Position switch box (5) on wall and secure with screws (6).
2. Position wall switch (4) near switch box (5) and connect wires to rear of switch. (Refer to paragraph 4-47)
3. Position wall switch (4) in switch box (5) and secure with two screws (3).
4. Position switch cover (2) against switch box (5) and secure with two screws (1).

4-15. BLACKOUT SWITCH REPLACEMENT, REPAIR, AND ADJUSTMENT

This task covers.

- a. Removal
- b. Cleaning, Inspection
- c. Repair
- d. Installation
- e. Adjustment

INITIAL SETUP

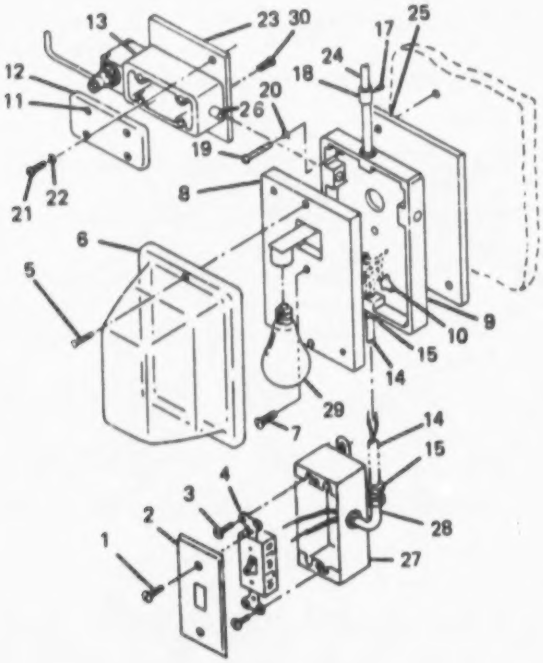
Standard Tools
General mechanics tool kit

Personnel
Electrician

REMOVAL

1. Remove two screws (1) and switch cover (2).

2. Remove two screws (3) and pull switch (4) from outlet box (27) as far as it will go.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7
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15
4
3
2
1
28
27

4-15. (cont)

3. Disconnect wires at rear of switch (4).

NOTE

Tag wires for reconnection.

4. Remove two screws (5) and light fixture cover (6). Remove bulb (29).

5. Remove screw (7) and separate light fixture (8) from light fixture adapter (9) as far as it will go.

6. Remove wire nuts (10) and disconnect wires from rear of light fixture (8).

NOTE

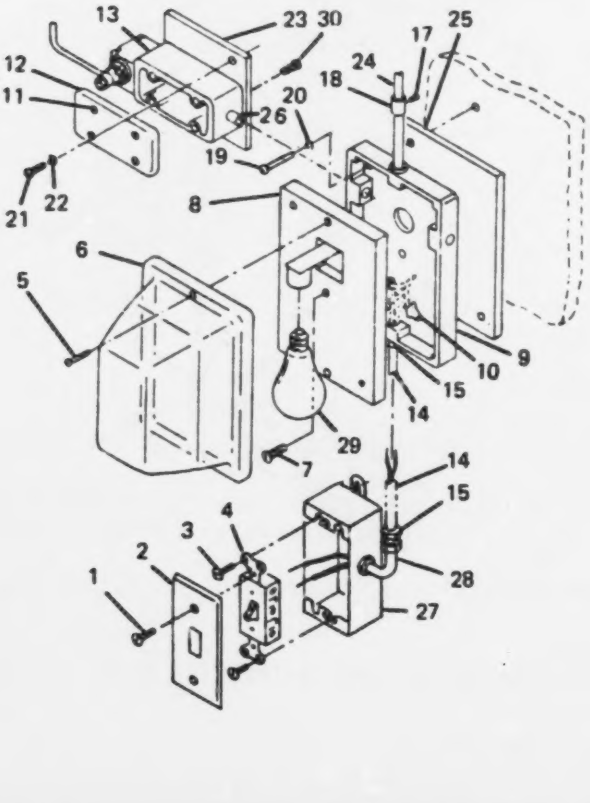
Tag wires for reconnection.

7. Loosen four captive screws (11) and remove limit switch cover (12).

8. Disconnect three sets of wires plus one ground wire inside limit switch (13).

NOTE

Tag wires for reconnection.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4-15. (cont)

9. Pull individual wires up through lower conduit (14) and into light fixture adapter (9).

10. Loosen two insulating connectors (15) below light fixture adapter (9), and remove lower conduit (14) from light fixture adapter (9) and elbow connector (28).

11. Loosen screw (17) at rear of offset connector (18).

12. Remove two screws (19) and lockwashers (20) from light fixture adapter (9).

13. Remove two screws (21) and lockwashers (22) from limit switch mounting plate (23).

14. Lower light fixture adapter (9) together with limit switch (13) and limit switch mounting plate (23) from upper conduit (24).

15. Remove incandescent light spacer (25).

16. Separate light fixture adapter (9) from limit switch (13) and limit switch mounting plate (23) by unscrewing close nipple (26).

17. Remove two screws (30) and separate limit switch (13) from limit switch mounting plate (23).

CLEANING, INSPECTION

1. Clean blackout switch and component surfaces.

2. Inspect mounting surfaces for corrosion and damage.

3. Inspect for and replace if necessary:

    a. Missing or damaged components.

    b. Corrosion or paint damage.

REPAIR

Corrosion or paint damage. (Refer to paragraph 4-44)

INSTALLATION

1. Assemble limit switch (13) to limit switch mounting plate (23) with two screws (30).

2. Assemble limit switch (13) with limit switch mounting plate (23) to light fixture adapter (9) using close nipple (26).

3. Pass wiring through close nipple (26) into limit switch (13).

4-15. (cont)

4. Connect wiring. (Refer to paragraph 4-47)

5. Position limit switch cover (12) on limit switch (13) and tighten four captive screws (11).

6. Pass wiring from upper conduit (24) through offset connector (18) at top of light fixture adapter (9) and position limit switch mounting plate (23) and light fixture adapter (9) with incandescent light spacer (25) behind it against endwall panel.

7. Install two screws (21) and lockwashers (22) securing limit switch (13) and limit switch mounting plate (23) to endwall panel.

8. Install two screws (19) and lockwashers (20) securing light fixture adapter (9) and incandescent light spacer (25) to endwall panel.

9. Pull wiring down into light fixture adapter (9), position offset connector (18), at top of adapter, and tighten.

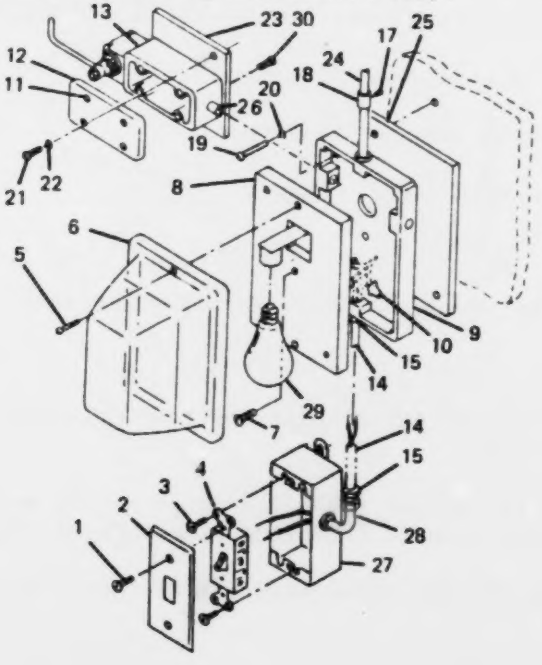
10. Tighten screw (17) at rear of offset connector (18).

11. Pass wiring for switch (4) through lower hole of light fixture adapter (9) and thread through lower conduit (14).

12. Position lower conduit (14) in hole at bottom of light fixture adapter (9).

13. Pull wiring through elbow connector (29) and into outlet box (28).

14. Position lower conduit (14) in elbow connector (29) and tighten upper and lower insulating connectors (15).



4-15. (cont)

15. Position switch (4) near outlet box (27) and connect wires. (Refer to paragraph 4-47)

16. Position switch (4) in outlet box (27) and secure with two screws (3).

17. Position switch cover (2) on switch (4) and secure with two screws (1).

18. Position light fixture (8) near light fixture adapter (9) and connect wires. (Refer to wire list.)

19. Position light fixture (8) on light fixture adapter (9) and secure with screw (7). Install bulb (29).

20. Position light fixture cover (6) on light fixture (8) and secure with two screws (5).

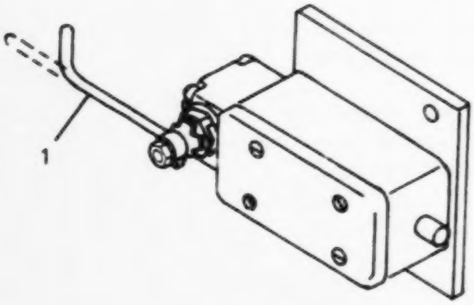
ADJUSTMENT

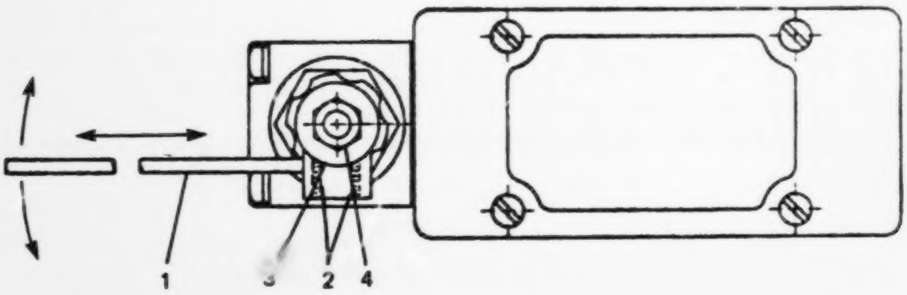
There are three possible adjustments which can be made on the blackout switch.

1. Bend limit switch arm (1) towards or away from the endwall panel.

2. Loosen two setscrews (2) and slide limit switch arm (1) in or out of collar (3).

3. Loosen nut (4) and rotate collar (3) with limit switch arm (1) up or down.





4-16. WIRING TESTING, REPLACEMENT, AND REPAIR

This task covers:

- a. Testing
- b. Removal
- c. Disassembly
- d. Cleaning, Inspection
- e. Repair
- f. Assembly
- g. Installation

INITIAL SETUP

Special Tools
Hand blind riveter, Appendix B, Item 2
Electrical tool kit, Appendix B, Item 5

Standard Tools
General mechanics tool kit

Test Equipment
Multimeter, Appendix b, Item 4

Personnel - 4
Electrician

Equipment Condition
Hinged roof area ceiling lights removed, paragraph 3-5

WARNING

Wiring in roof beam contains voltage that is dangerous if contacted. Before replacing wiring, make sure all circuit breakers and switches are set to OFF position.

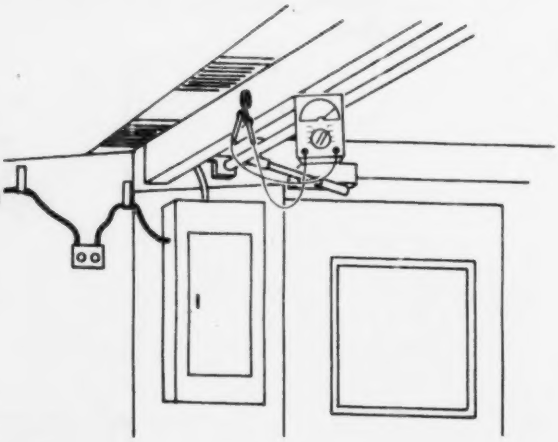
TESTING

1. Set all circuit breakers and switches to OFF position.

2. Using multimeter, check for continuity at outlet receptacles mounted on fixed sidewall, hinged sidewall, and hinged endwalls.

3. Check for continuity at electrical light receptacles in roof beam.

4. If no continuity is present, replace defective outlet receptacle or electrical light receptacle.



4-16. (cont)

REMOVAL

Roof Beam Wiring

1. Open circuit breaker panel door (1).

2. Loosen four captive screws (2) and move four clamp fingers (3) to OPEN position.

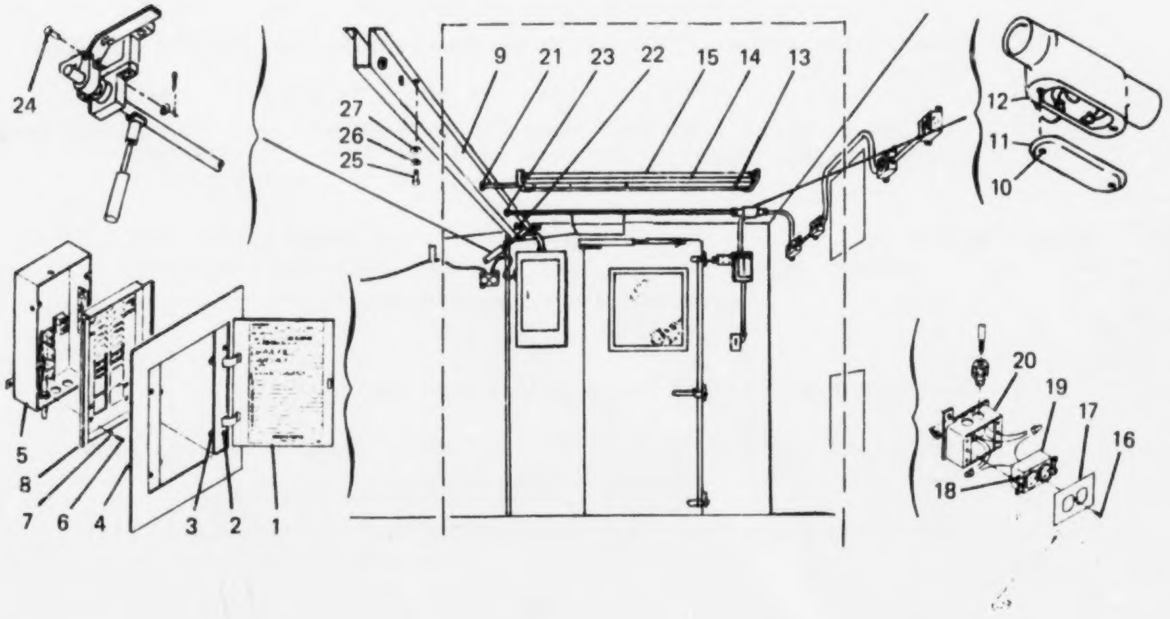
3. Lift circuit breaker panel cover (4) from circuit breaker box (5).

4. Remove four screws (6) and washers (7) and lift panelboard (8) from circuit breaker box (5).

5. Disconnect wires from roof beam (9) in circuit breaker box (5).

NOTE

Tag wires for reconnection.



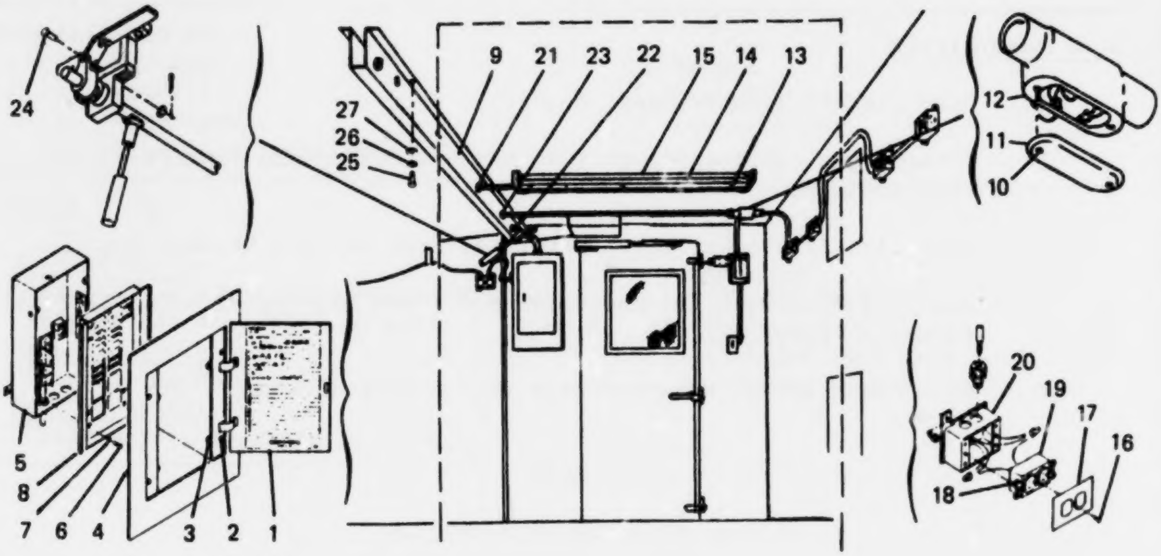
6. Loosen two captive screws (10) and remove conduit outlet cover (11) from conduit outlet body (12).

7. Disconnect wires from roof beam (9) in conduit outlet body (12).

NOTE

Tag wires for reconnection.

4-16. (cont)



8. Remove nine screws (13) and three fixed roof area ceiling light covers (14).

9. Disconnect wires from roof beam (9) in each of three fixed roof area ceiling lights (15).

NOTE

Tag wires for reconnection.

10. Remove screw (16) and receptacle cover (17).

11. Loosen two captive screws (18) and remove receptacle (19) from outlet box (20) as far as it will go.

12. Disconnect wires from roof beam (9) at rear of receptacle (19).

NOTE

Tag wires for reconnection.

13. Disconnect conduit locknuts (21) at roof beam area between roof beam (9) and each of three fixed roof area ceiling lights (15).

14. Disconnect conduit locknut (22) at roof beam area between roof beam (9) and top of circuit breaker box (5).

4-16. (cont)

15. Disconnect conduit locknut (23) at roof beam area between roof beam (9) and conduit outlet body (12).

16. Remove push bat assembly pins (24) at each of three push bar assemblies.

17. Remove bolts (25), lockwashers (26), and washers (27) from roof beam (9).

18. Remove roof beam (9) from roof panel.

Fixed Sidewall Wiring

19. Loosen two captive screws (10) and remove conduit outlet cover (11) from conduit outlet body (12).

20. Disconnect wires from four fixed sidewall duplex receptacles (28) in conduit outlet body (12).

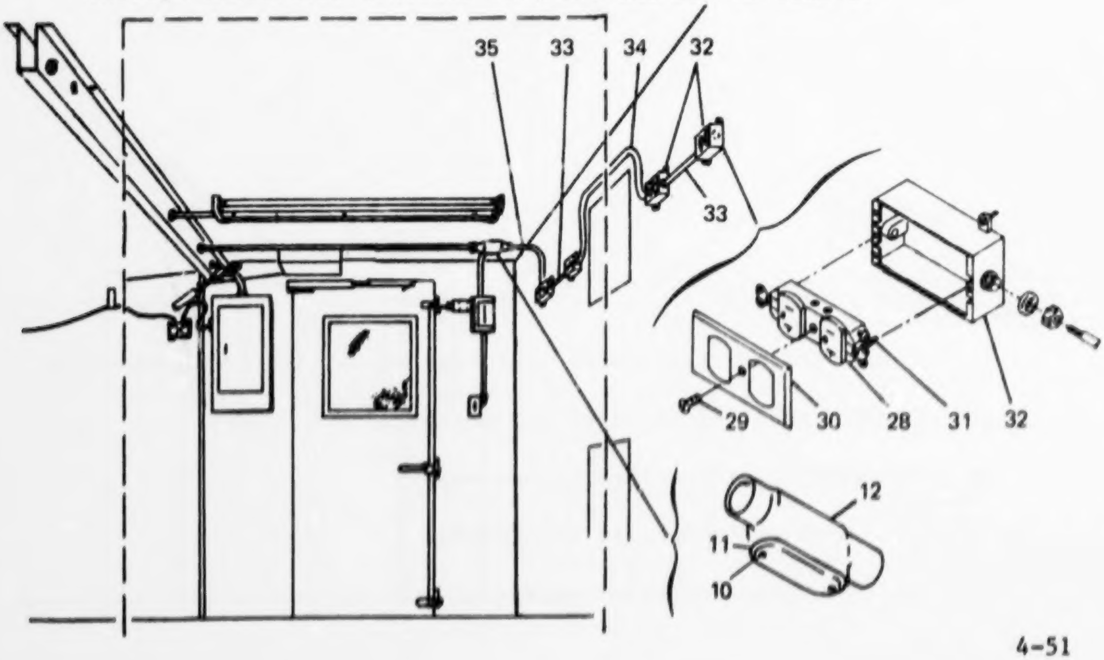
NOTE

Tag wires for reconnection.

21. Remove screws (29) and duplex covers (30).

22. Loosen captive screws (31) and remove duplex receptacles (28) from outlet boxes (32) as far as they will go.

23. Disconnect wires from rear of duplex receptacles (28) and pull wire through electrical conduits (33, 34, and 35) to remove.



4-16. (cont)

DISASSEMBLY

Roof Beam Assembly

1. Remove twenty-four wire nuts (1), twenty cable ties (2), and eleven terminal lugs (3).

2. Remove six screws (4), nuts (5), lockwashers (6), and three receptacles (7) from roof beam (14).

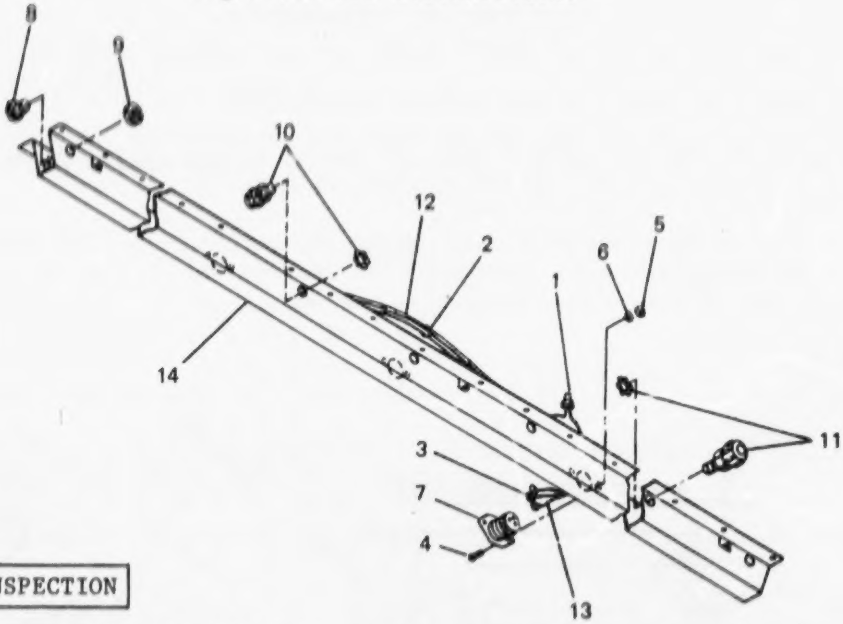
3. Remove liquid tight connector (8) and locknut (9).

4. Remove three insulated connectors (10), two connectors (11), and electrical cord (12).

5. Remove wires (13) from receptacles (7).

NOTE

Tag wires for reconnection.



CLEANING, INSPECTION

1. Clean left and right side roof beam assemblies and components.

2. Inspect mounting surfaces for corrosion and damage.

3. Inspect for and replace if necessary:

   a. Missing or damaged components.

   b. Corrosion or paint damage.

4-16. (cont)

REPAIR

1. Replace damaged wiring.

2. Corrosion or paint damage. (Refer to paragraph 4-44)

ASSEMBLY

Roof Beam Assembly

1. Connect wires (13) to receptacles (7). (Refer to paragraph 4-47)

2. Install three insulated connectors (10), two connectors (11), and electrical cord (12) in roof beam (14).

3. Install liquid tight connector (8) and locknut (9) in roof beam (14).

4. Install three receptacles (7) in roof beam (14) and secure with six screws (4), nuts (5), and lockwashers (6).

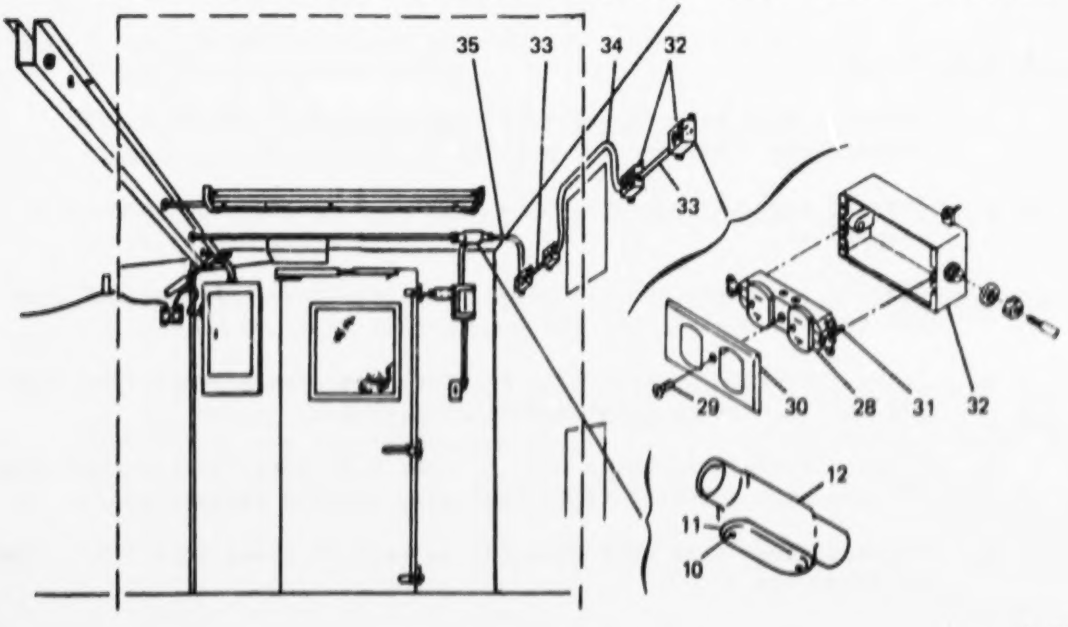
5. Attach twenty-four wire nuts (1), twenty cable ties (2), and eleven terminal lugs (3).

INSTALLATION

Fixed Sidewall Wiring

1. Pull wires through electrical conduits (33, 34, and 35).

2. Connect wires to rear of duplex receptacles (28). (Refer to para.4-47)



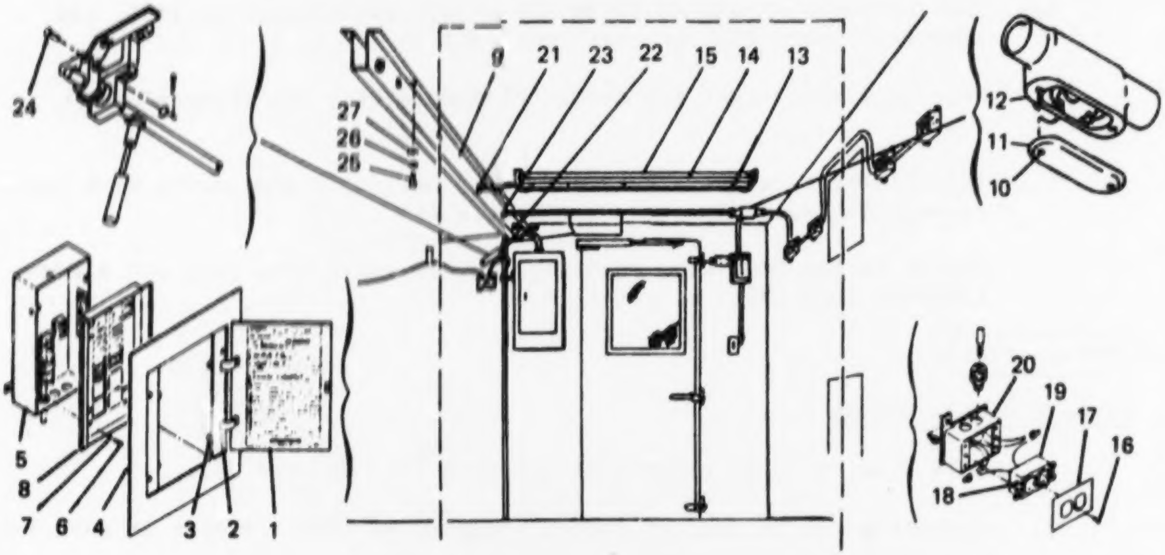
4-16. (cont)

3. Position duplex receptacles (28) in outlet boxes (32) and secure by tightening captive screws (31).

4. Attach duplex covers (30) to duplex receptacles (28) with screws (29).

5. Connect wires from fixed sidewall duplex receptacles (28) in conduit outlet body (12). (Refer to paragraph 4-47)

6. Position conduit outlet cover (11) on conduit outlet body (12) and secure by tightening two captive screws (10).



Roof Beam Wiring

1. Position roof beam (9) against roof and install washers (27), lockwashers (26), and bolts (25).

2. Install push bar assembly pins (24) at each of three push bar assemblies.

3. Connect conduit locknut (23) at roof beam area between roof beam (9) and conduit outlet body (12).

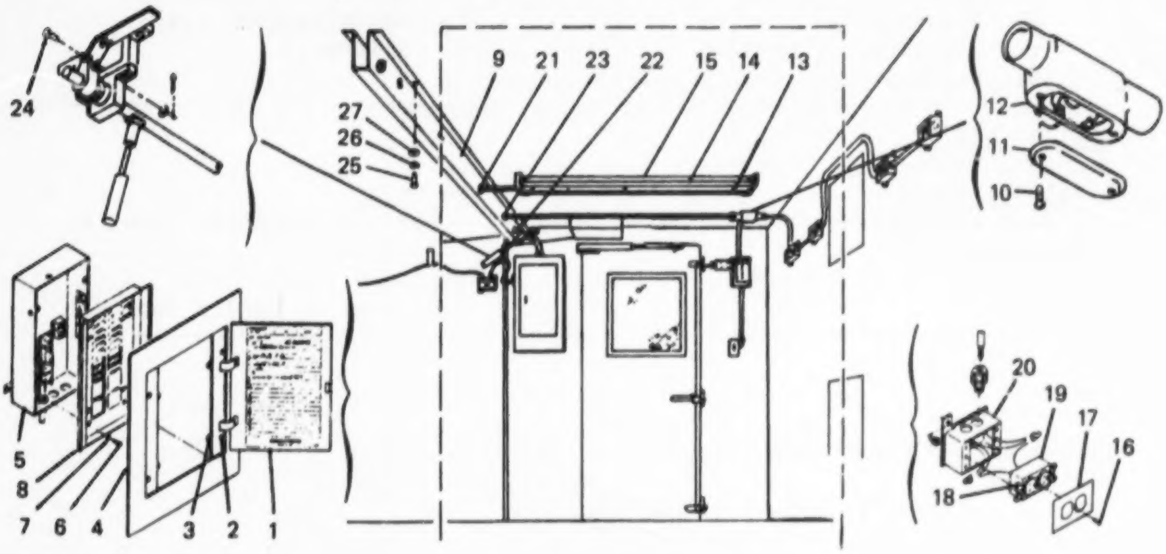
4. Connect conduit locknut (22) at roof beam area between roof beam (9) and top of circuit breaker box (5).

5. Connect conduit locknuts (21) at roof beam area between roof beam (9) and each of three fixed roof area ceiling lights (15).

6. Connect wires from roof beam (9) to rear of receptacle (19). (Refer to paragraph 4-47)

4-16. (cont)

7. Install receptacle (19) in outlet box (20) and tighten two captive screws (18).



8. Attach duplex receptacle cover (17) to outlet box (20) with screw (16).

9. Connect wires from roof beam (9) to each of three fixed roof area ceiling lights (15). (Refer to paragraph 4-47)

10. Attach three fixed roof area ceiling light covers (14) to three fixed area ceiling lights (15) with nine screws (13).

11. Connect wires from roof beam (9) to conduit outlet body (12). (Refer to paragraph 4-47)

12. Attach conduit outlet cover (11) to conduit outlet body (12) by tightening two captive screws (10).

13. Connect wires from roof beam (9) to circuit breaker box (5). (Refer to paragraph 4-47)

14. Position panelboard (8) over circuit breakers in circuit breaker box (5) and secure with four screws (6) and washers (7).

15. Position circuit breaker panel cover (4) against circuit breaker box (5) and secure by moving four clamp fingers (3) to LOCK position and tightening four captive screws (2).

16. Close circuit breaker panel door (1).

4-17. PERSONNEL AND RIGHT CARGO DOOR REPLACEMENT, REPAIR, AND ALIGNMENT

This task covers:

a. Removal
b. Disassembly
c. Cleaning, Inspection
d. Repair
e. Assembly
f. Installation
g. Alignment

INITIAL SETUP

Special tools
Hand blind riveter, Appendix B, Item 2
Personnel - 2

Materials
Sealing compound, Item 19, Appendix E
Standard tools
General mechanics tool kit

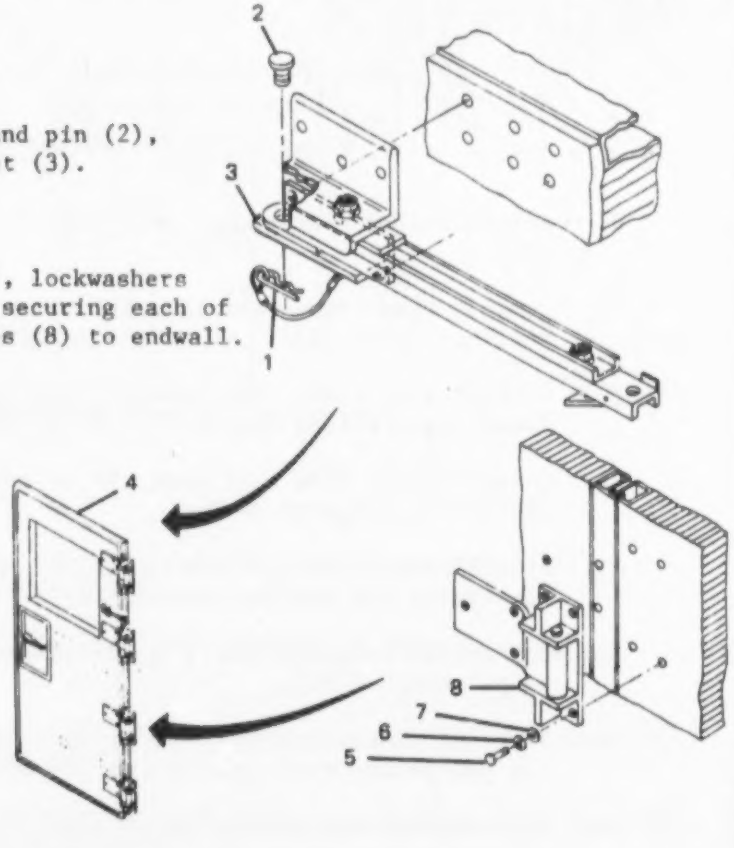
REMOVAL

Personnel and Right Cargo Door

1. Remove hairpin (1), and pin (2), and swing back bracket (3).

2. Close door (4).

3. Remove four bolts (5), lockwashers (6), and washers (7) securing each of four hinge base plates (8) to endwall.



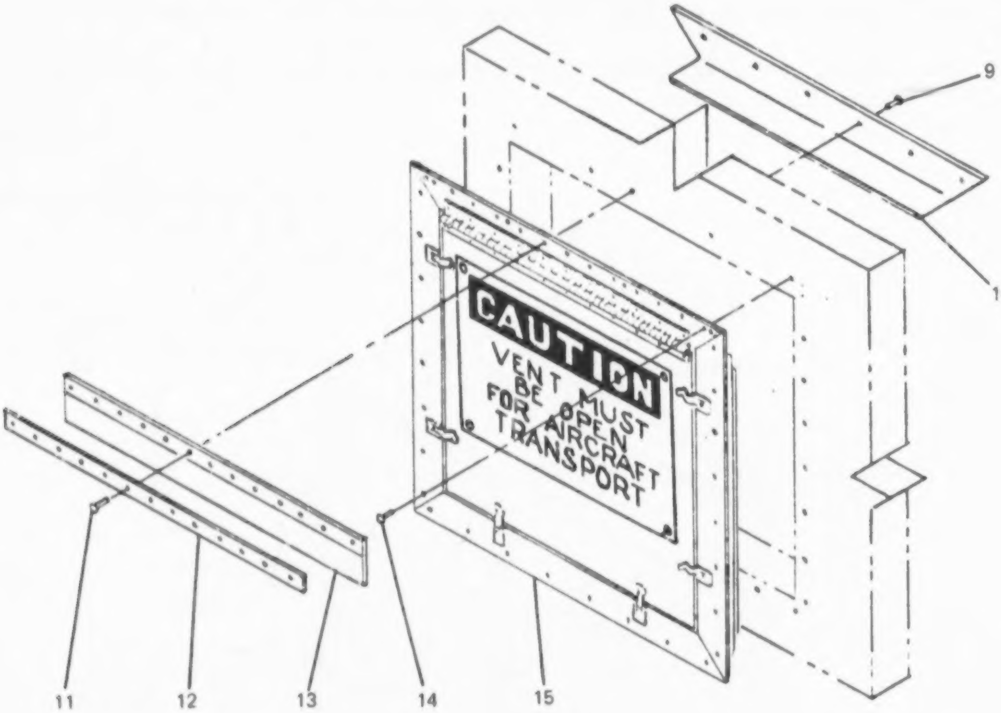
4-17. (cont)

Door Vent

4. Drill out rivets (9) and remove four vent retainer strips (10). (Refer to paragraph 4-33)

5. Drill out rivets (11) and remove retainer strip (12) and rain strip (13). (Refer to paragraph 4-33)

6. Drill out rivets (14) and remove door vent (15). (Refer to paragraph 4-33)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CAUTION
VENT MUST BE OPEN FOR AIRCRAFT TRANSPORT
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Door Lock Assembly

7. Remove three retaining rings (16), four flanged bearings (17), and top rod (18).

8. Remove four screws (32), four bolts (33), lockwashers (34), washers (35), mounting plates (36 and 37), and screw (38).

9. Remove nuts (19), washers (20 and 21), latch arms (22), spacers (23), and pins (24).

4-17. (cont)

10. Drive out dowel pins (25 and 26) and remove inside handle (27), latch arm (28), washer (29), pin (30) and bottom rod (31).

11. Repeat steps 7 through 10 to remove lower latch arm.

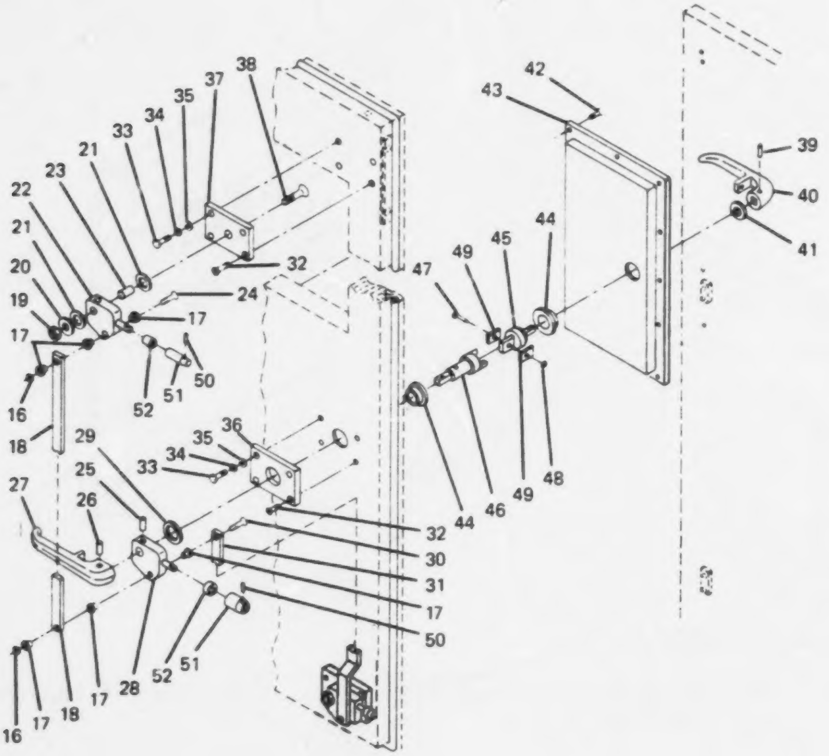
12. Drive out dowel pin (39) and remove outside handle (40) and washers (41).

13. Drill out rivets (42) and remove pan (43). (Refer to 4-33).

14. Remove flanged bearings (44) and shafts (45 and 46).

15. Drill out rivet (47) and remove washer (48) and spacers (49).

16. Drive out dowel pins (50) and remove rollers (51) and roller extensions (52).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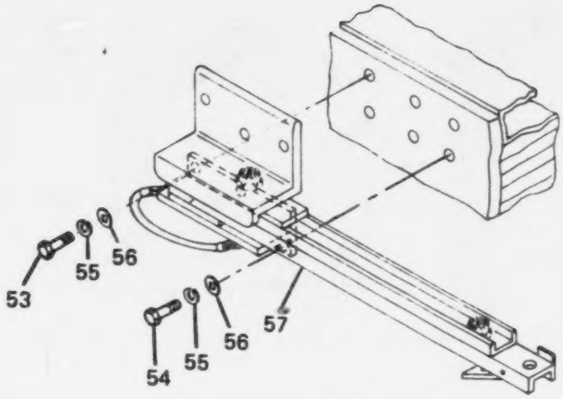
Door Stop Assembly

17. Remove six bolts (53 and 54), lockwashers (55), and washers (56).

18. Remove door stop assembly (57) from door.

4-17. (cont)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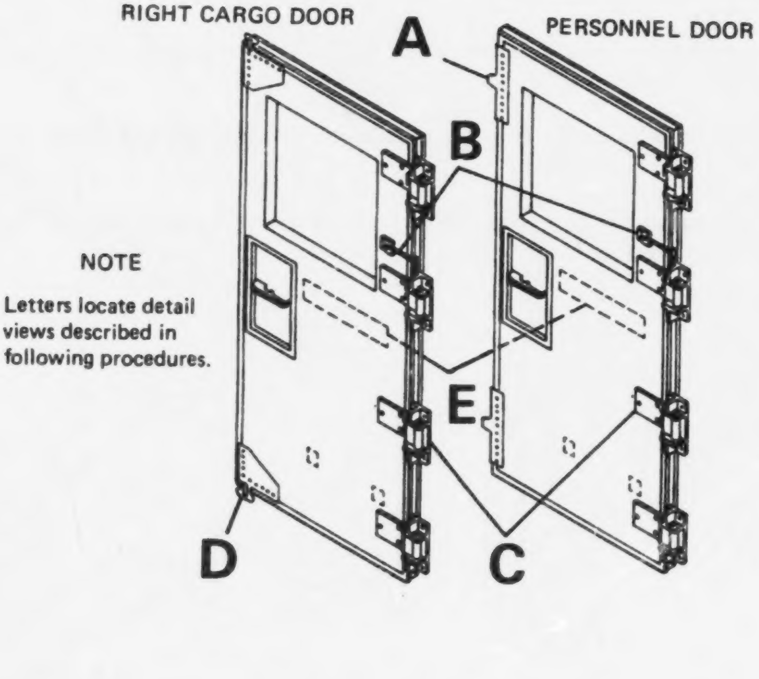
DISASSEMBLY

Personnel and Right Cargo Door


RIGHT CARGO DOOR
PERSONNEL DOOR
A
B
C
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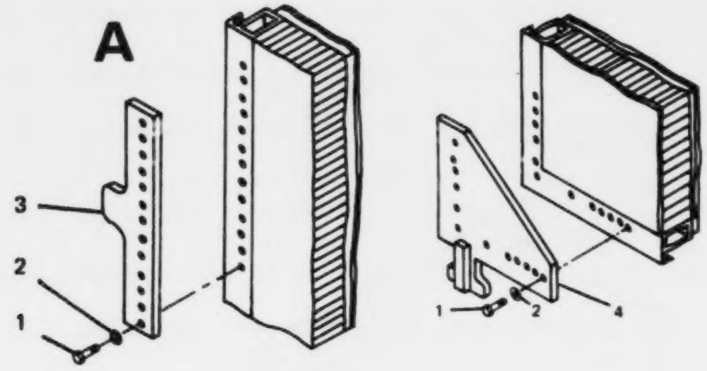
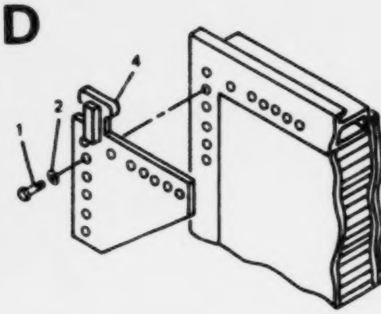
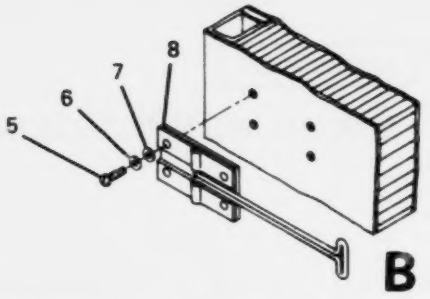
NOTE

Letters locate detail views described in following procedures.

4-17. (cont)







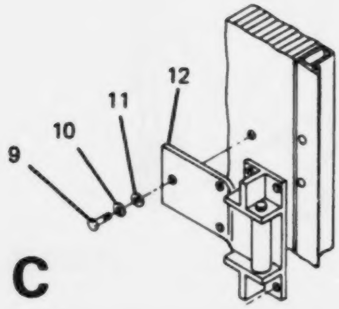
1. Remove screws (1) and lockwashers (2) securing personnel door shear plate (3) or cargo door shear plate (4) to door.

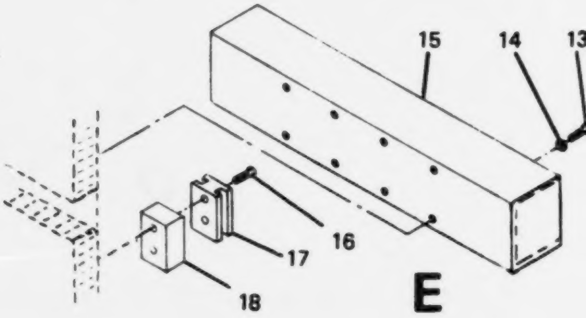
2. Remove screws (5), lockwashers (6), and washers (7) securing door holder (8) to door.

3. Remove bolts (9), lockwashers (10), and washers (11) securing hinge (12) to door.

4. Remove screws (13) and lockwashers (14) securing jack storage bracket (15) to door.

5. Remove screws (16) securing jack support bracket (17) and spacer (18) to door.





4-17. (cont)

Door Vent

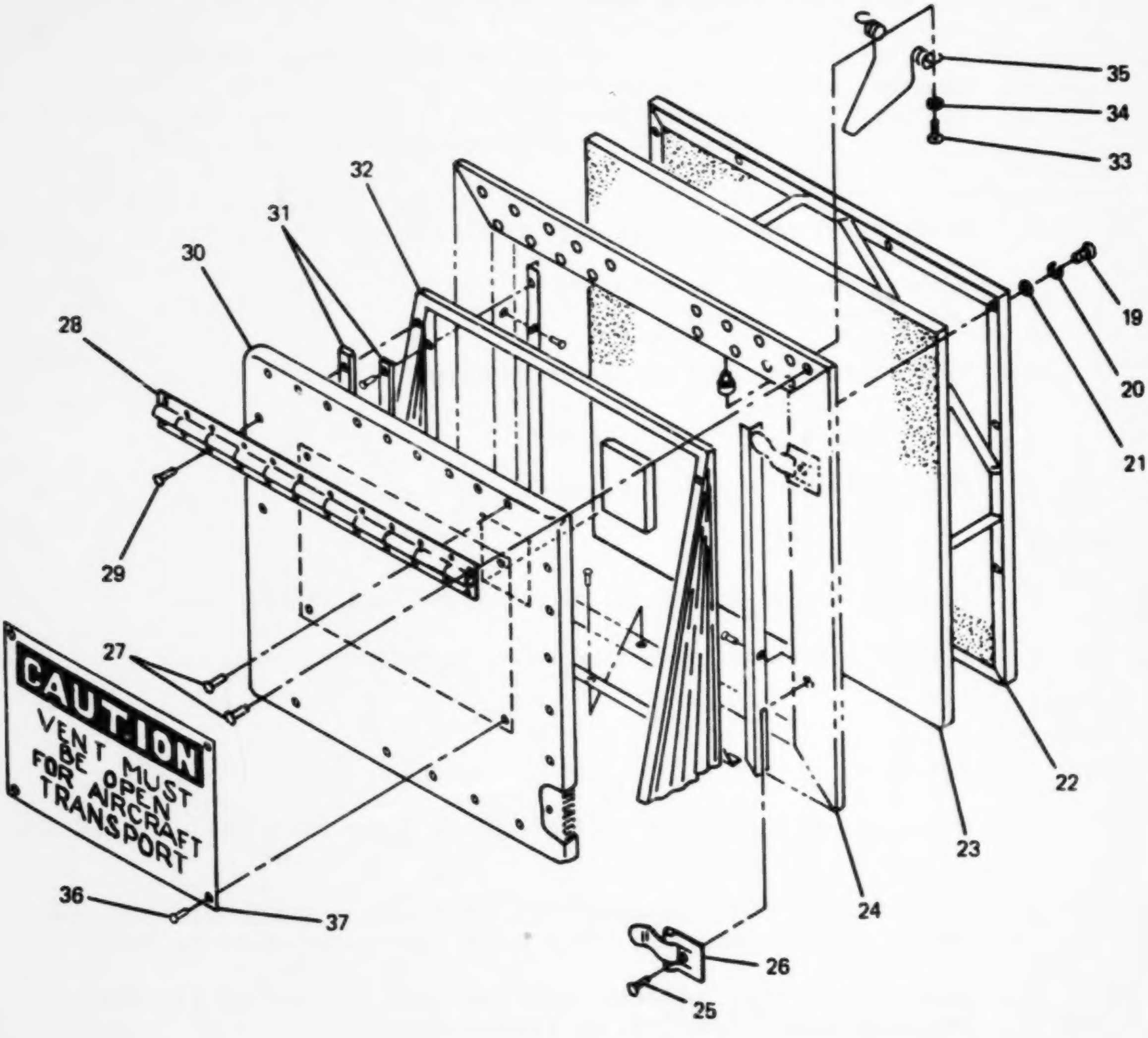
6. Remove screws (19), lockwashers (20), and washers (21) securing filter frame (22) and filter (23) to vent frame (24).

7. Drill out rivet (25) and remove fastener (26). (Refer to paragraph 4-33)
8. Drill out rivets (27) and remove hinge (28). (Refer to paragraph 4-33)

9. Drill out rivets (29) and remove door vent (30), retainer strips (31), and curtain (32). (Refer to paragraph 4-33)

10. Remove bolts (33), washers (34), and spring (35).

11. Drill out rivets (36) and remove caution plate (37).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CAUTION
VENT MUST BE OPEN FOR AIRCRAFT TRANSPORT
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4-17. (cont)

Door Stop Assembly

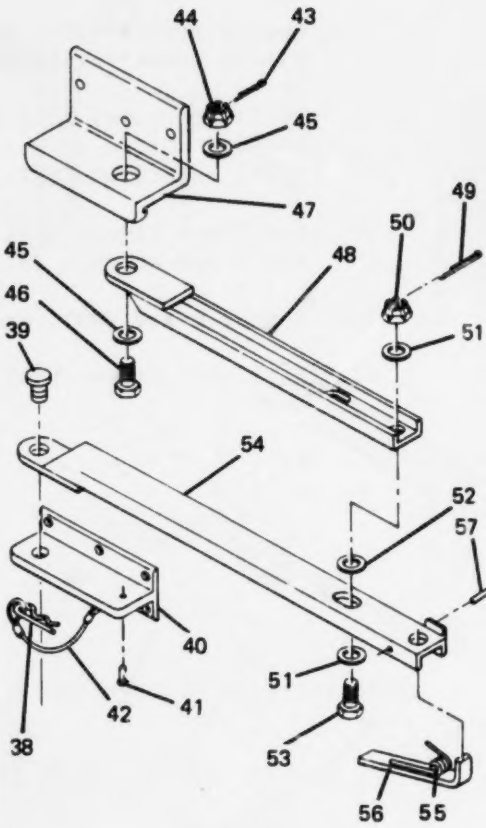
12. Remove hair pin (38), pin (39), and bracket (40).

13. Drill out rivet (41) to remove lanyard (42). (Refer to 4-33)

14. Remove cotter pin (43), nut (44), washers (45), and bolt (46) securing bracket (47) to upper brace (48).

15. Remove cotter pin (49), nut (50), washers (51), nylon washer (52), and bolt (53) securing upper brace (48) to lower brace (54).

16. Compress spring (55) with catch (56) and drive out roll pin (57).



CLEANING, INSPECTION

1. Clean panel and component surfaces.

2. Inspect mounting surfaces for corrosion and damage.

3. Inspect for and replace if necessary:

   a. Missing or damaged components

   b. Corrosion or paint damage.

REPAIR

1. Panel skin damage. (Refer to paragraph 4-32 through 4-42)

2. Corrosion or paint damage. (Refer to paragraph 4-44)

ASSEMBLY

Door Stop Assembly

1. Position catch (56) and spring (55) in lower brace (54) and install roll pin (57).

2. Install bolt (53), washers (51), nylon washer (52), nut (50), and cotter pin (49) securing lower brace (54) to upper brace (48).

3. Install bolt (46), washers (45), nut (44), and cotter pin (43), securing upper brace (48) to bracket (47).

4-17. (cont)

4. Position lanyard (42) on bracket (40) and install rivet (41). (Refer to paragraph 4-33)

5. Insert pin (39) through lower brace (54) and bracket (40) and install hair pin (38).

6. Refinish (paragraph 4-44)

Door Vent

7. Position spring (35) and install washers (34) and bolts (33).

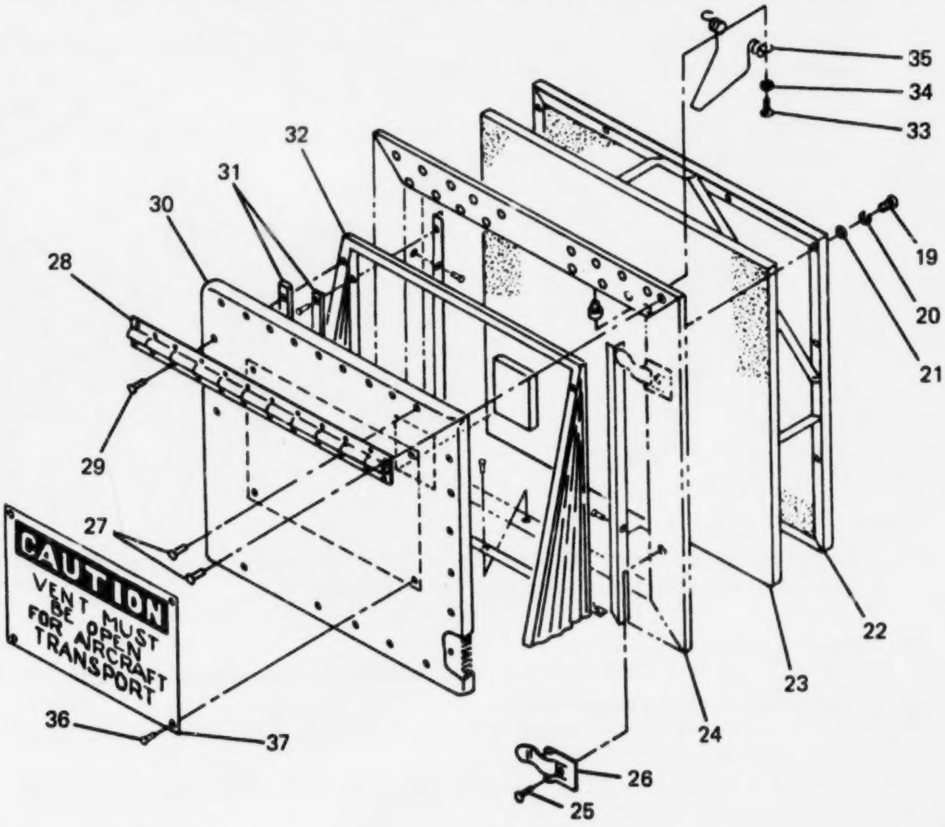
8. Assemble curtain (32), retainer strips (31), and door vent (30) and install rivets (29). (Refer to paragraph 4-33)

9. Position hinge (28) and install rivets (27). (Refer to paragraph 4-33)

10. Position fastener (26) and install rivet (25). (Refer to paragraph 4-33)

11. Assemble vent frame (24), filter (23), and filter frame (22) and install washers (21), lockwashers (20), and screws (19).

12. Apply sealing compound to rear of caution plate (37), place against door vent (30) and install rivets (36). (Refer to paragraph 4-33)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CAUTION
VENT MUST BE OPEN FOR AIRCRAFT TRANSPORT
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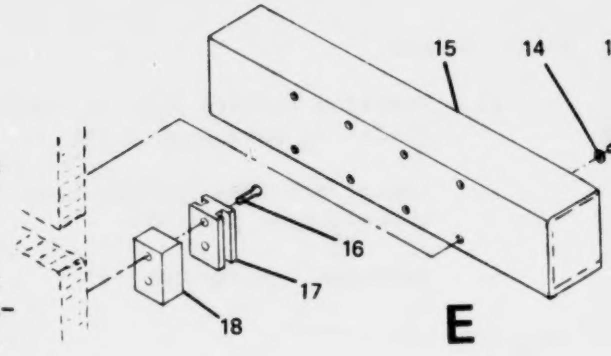
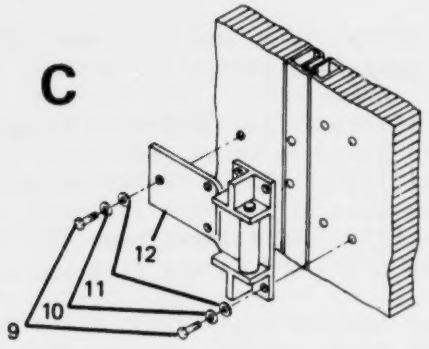
4-17. (cont)

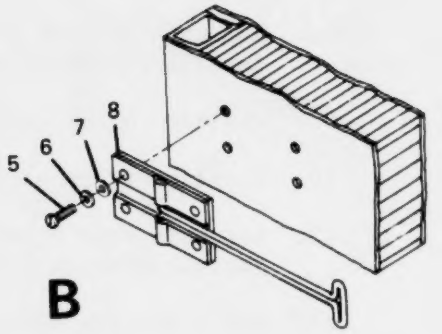
Personnel and Right Cargo Door

13. Position spacer (18) and jack support bracket (17) on door and install screws (16).

14. Position jack storage bracket (15) on door and install lockwashers (14) and screws (13).

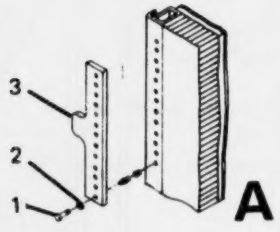


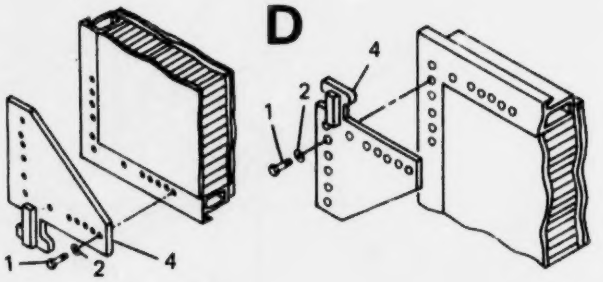




15. Position hinge base plate (12) on door and install washers (11), lock washers (10) and bolts (9).

16. Position door holder (8) on door and install washers (7), lockwashers (6), and screws (5).





17. Position personnel shear plate (3) or cargo shear plate (4) on door and install lockwashers (2) and screws (1).

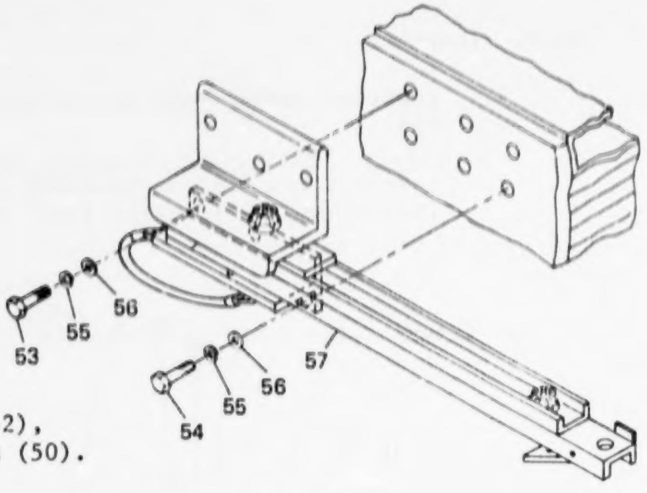
18. Seal (paragraph 4-43)

19. Refinish (paragraph 4-44)

4-17. (cont)

INSTALLATION

Door Stop Assembly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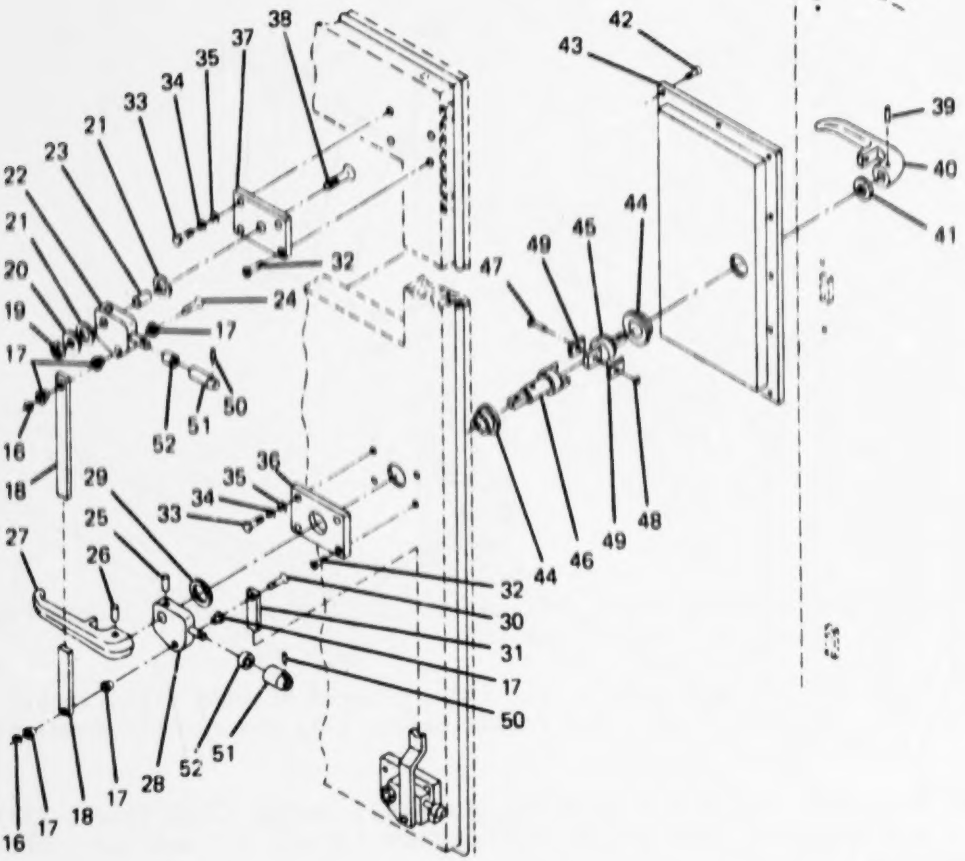
1. Attach door stop (57) to door with six washers (56), lockwashers (55), and bolts (53 and 54).

Door Lock Assembly

2. Install roller extensions (52), rollers (51), and dowel pins (50).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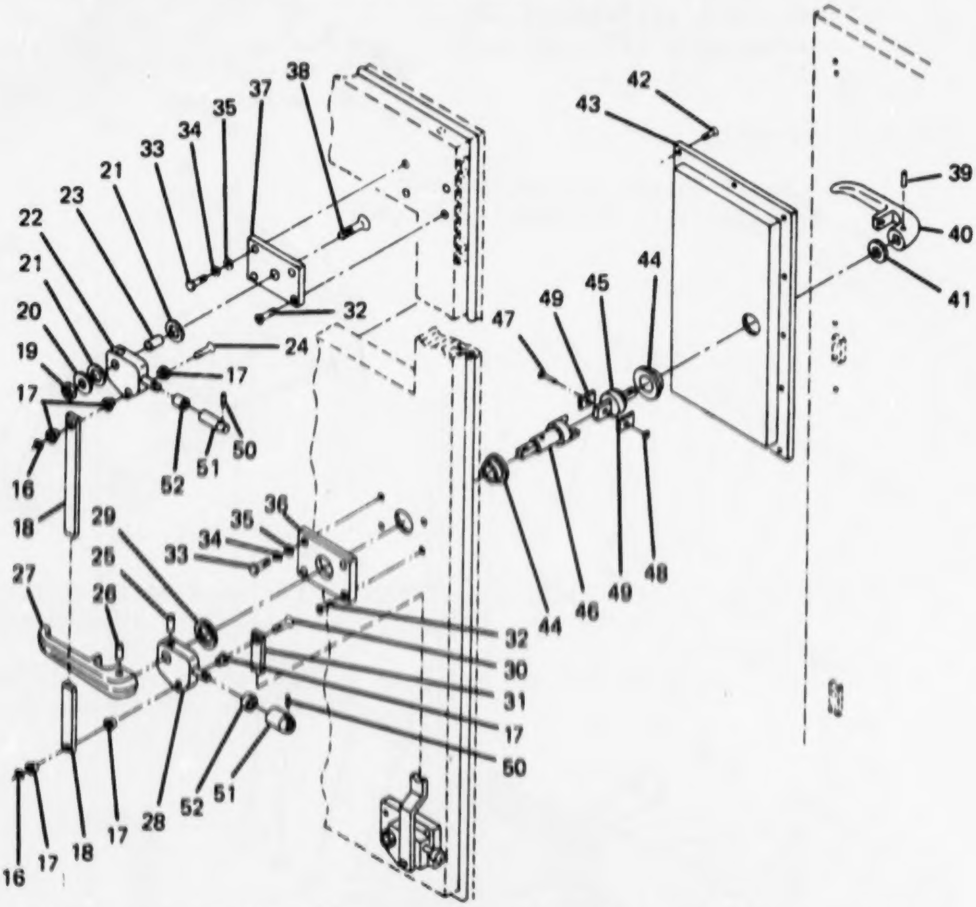
3. Install spacers (49), washer (48), and rivet (47). (Refer to paragraph 4-33)
4. Install shafts (46 and 45) and flanged bearings (44) in door panel.
5. Position pan (43) and install rivets (42). (Refer to paragraph 4-33)

4-17. (cont)

6. Position washer (41) and outside handle (40) and install dowel pin (39).

7. Insert screw (38) in mounting plate (37) and install washers (35), lockwashers (34), bolts (33), and screws (32).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8. Position mounting plate (36) and install washers (35), lockwashers (34), bolts (33), and screws (32).

9. Position bottom rod (31), pin (30), flanged bearing (17), washer (29), latch arm (28), and inside handle (27) and install dowel pins (25 and 26).

10. Position flanged bearing (17), pin (24), washer (21), spacer (23), and latch arm (22) and install washers (20 and 21) and nut (19).

11. Position flanged bearing (17), top rod (18), and flanged bearing (17) and install retaining ring (16).

12. Seal (paragraph 4-43)

13. Refinish (paragraph 4-44)

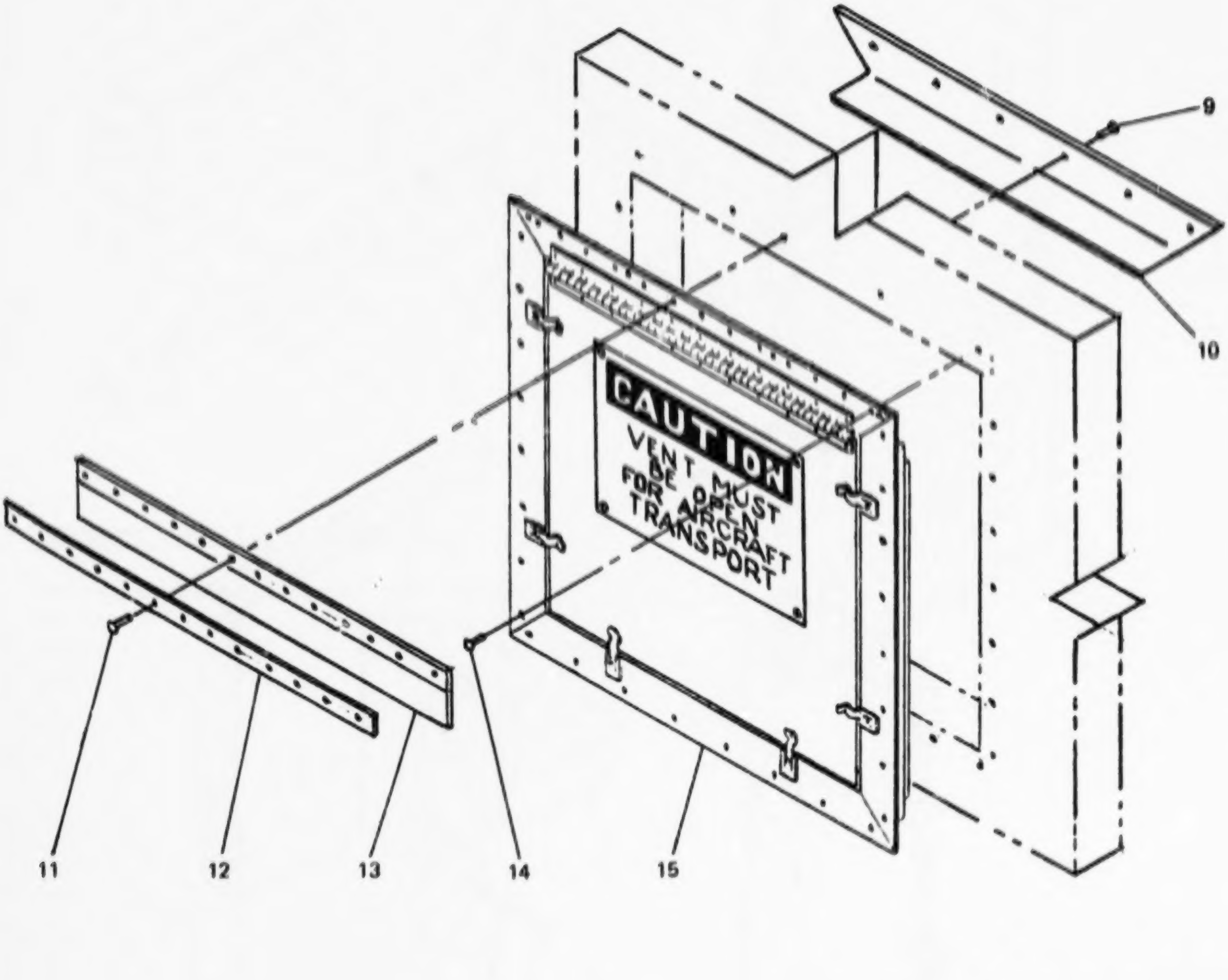
4-17. (cont)

Door Vent

14. Position vent (15) in door and install rivets (14). (Refer to paragraph 4-33)

15. Position rain strip (13) and retainer strip (12) and install rivets (11). (Refer to paragraph 4-33)

16. Position retainer strips (10) and install rivets (9). (Refer to 4-33)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CAUTION
VENT MUST BE OPEN FOR AIRCRAFT TRANSPORT
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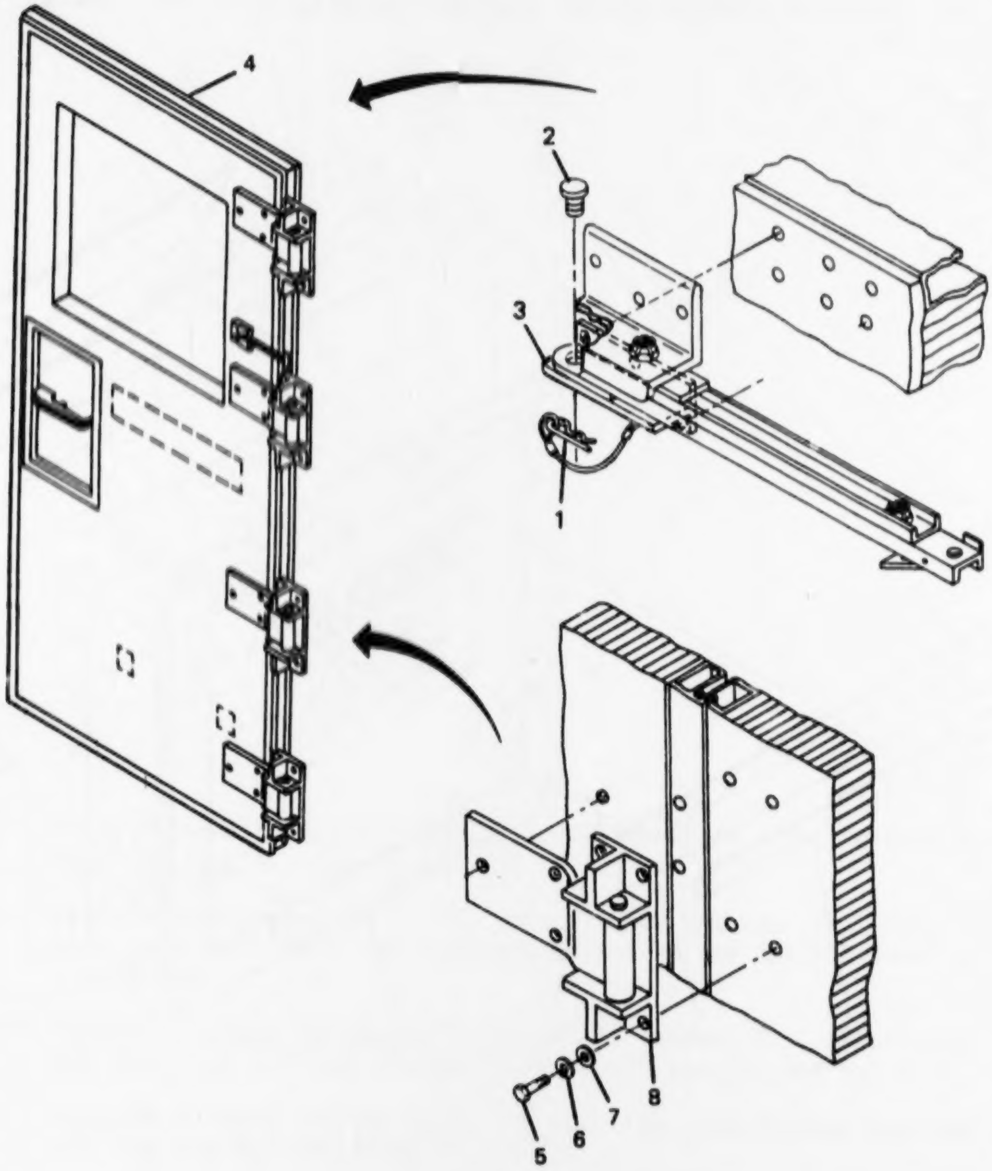
4-17. (cont)

Personnel and Right Cargo Door

17. Secure each of four hinge base plates (8) to endwall with four washers (7), lockwashers (6), and bolts (5).

18. Position bracket (3) and install pin (2) and hairpin (1).

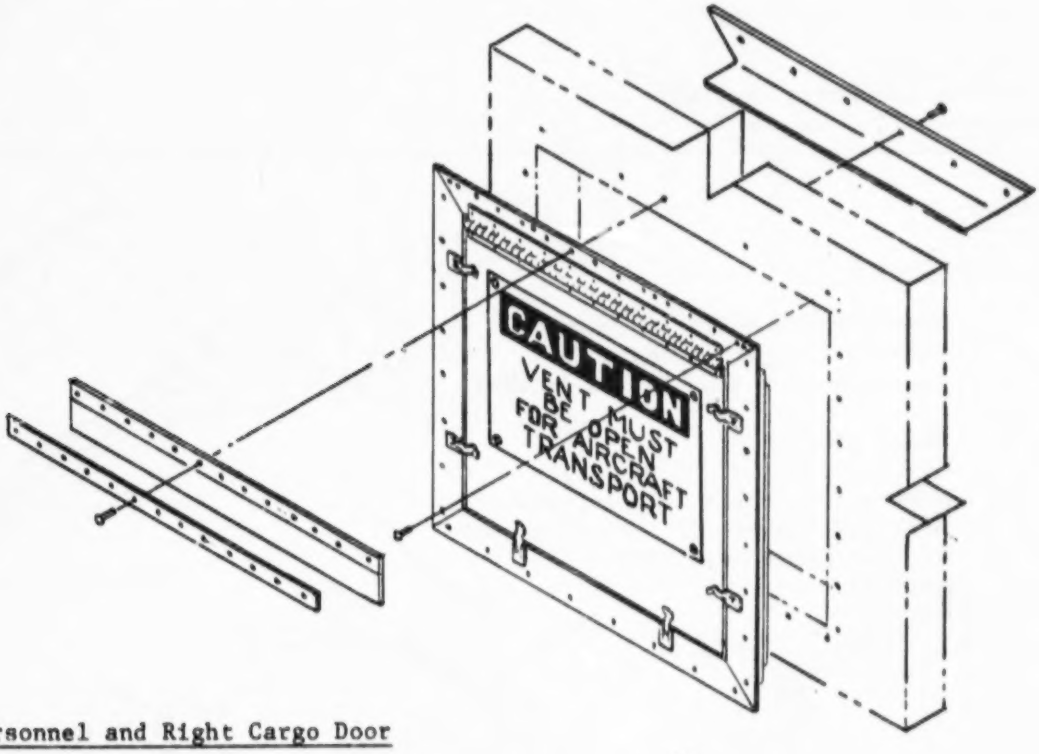


4-17. (cont)

ALIGNMENT

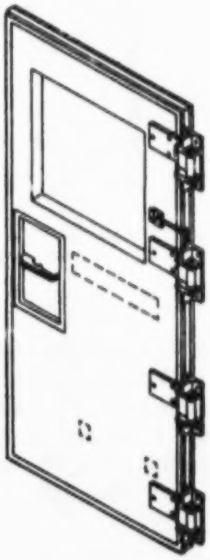
Door Vent

When installing door vent, make sure to center in door so there is an equal gap at both sides and at the top and bottom.


CAUTION
VENT MUST
BE OPEN
FOR AIRCRAFT
TRANSPORT

Personnel and Right Cargo Door

Loosen hinge bolts and place wedges as required around periphery of door so there is an equal gap at both sides and at top and bottom.



4-18. LEFT CARGO DOOR REPLACEMENT, REPAIR, AND ALIGNMENT

This task covers:

- a. Removal
- b. Disassembly
- c. Cleaning, Inspection
- d. Repair
- e. Assembly
- f. Installation
- g. Alignment

INITIAL SETUP

Standard Tools
General mechanics tool kit
Personnel - 2

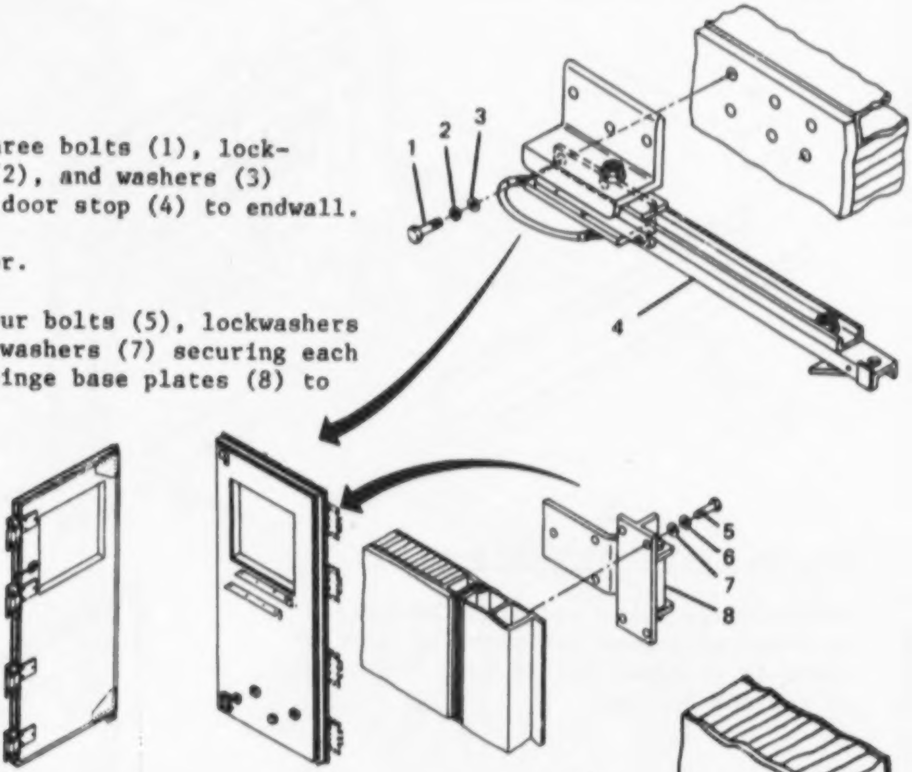
REMOVAL

Left Cargo Door

1. Remove three bolts (1), lockwashers (2), and washers (3) securing door stop (4) to endwall.

2. Close door.

3. Remove four bolts (5), lockwashers (6), and washers (7) securing each of four hinge base plates (8) to endwall.

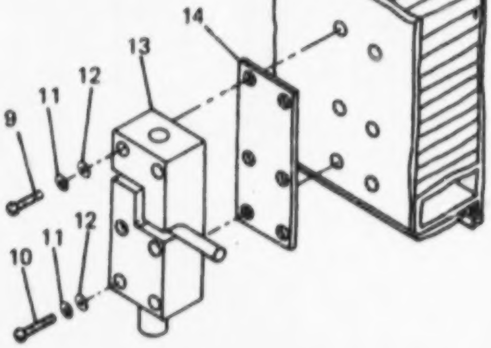


Door Vent

Refer to paragraph 4-17.

Foot Bolt Assembly

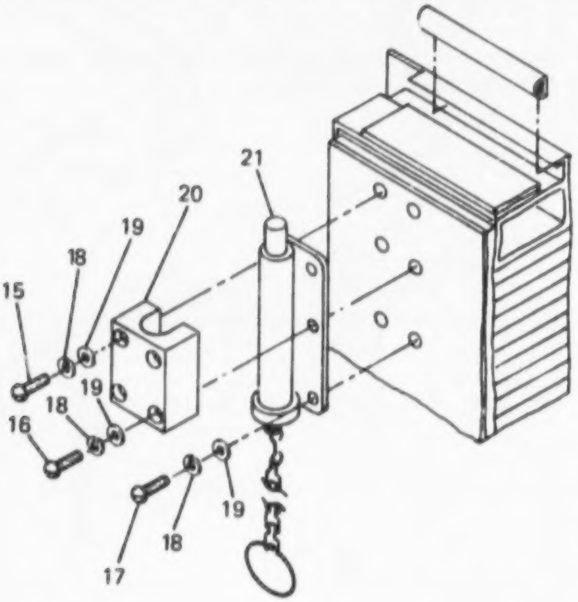
4. Remove six screws (9 and 10), lockwashers (11), and washers (12), securing foot bolt assembly (13) and spacer (14) to door.



4-18. (cont)

Chain Bolt Assembly

5. Remove six screws (15, 16, and 17), lockwashers (18), and washers (19) securing chain bolt housing (20), and chain bolt (21) to door.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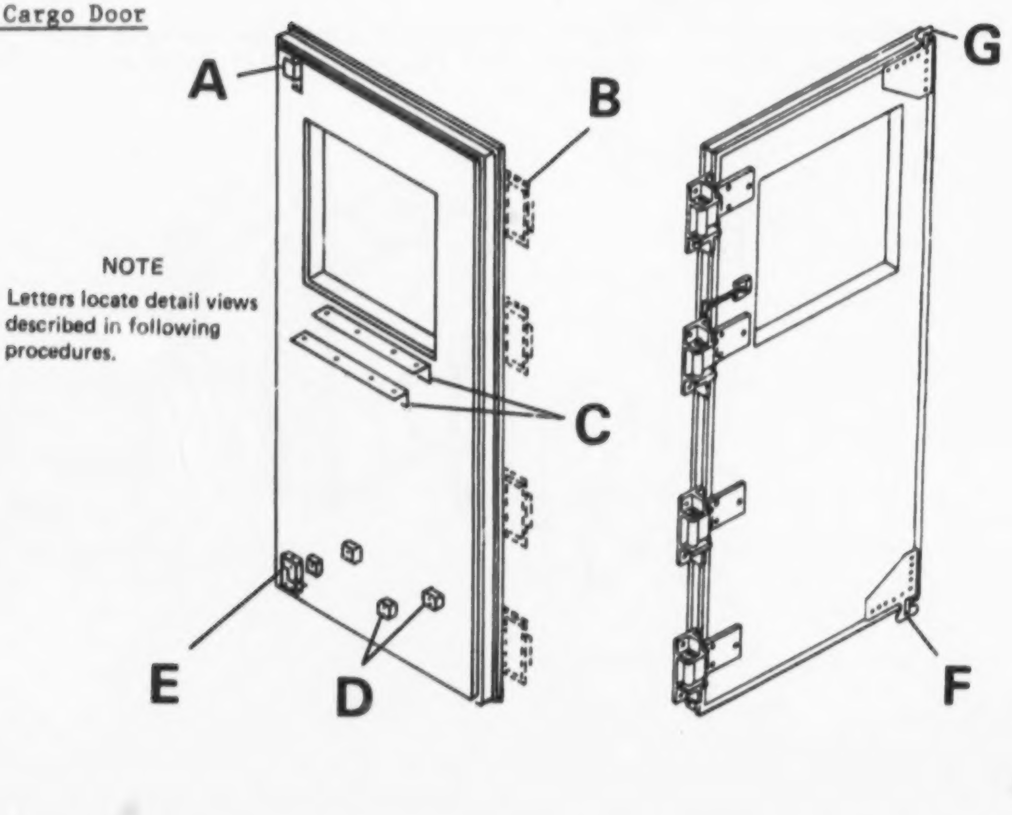
DISASSEMBLY

Left Cargo Door



NOTE

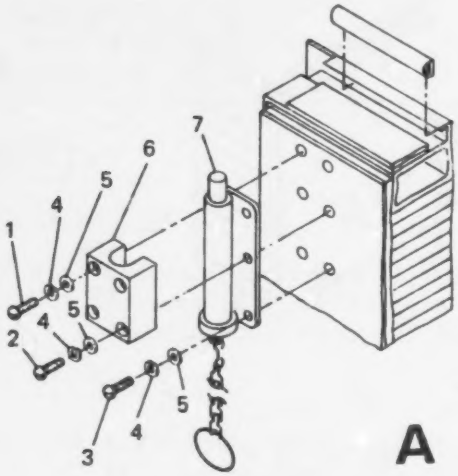
Letters locate detail views described in following procedures.

4-18. (cont)

1. Remove six screws (1, 2, and 3), lockwashers (4), and washers (5) securing chain bolt housing (6) and chain bolt (7) to door.

2. Remove screws (8), lockwashers (9), and washers (10) securing door holder (11) to door.

3. Remove bolts (12), lockwashers (13), and washers (14) securing hinge plate (15) to door and panel.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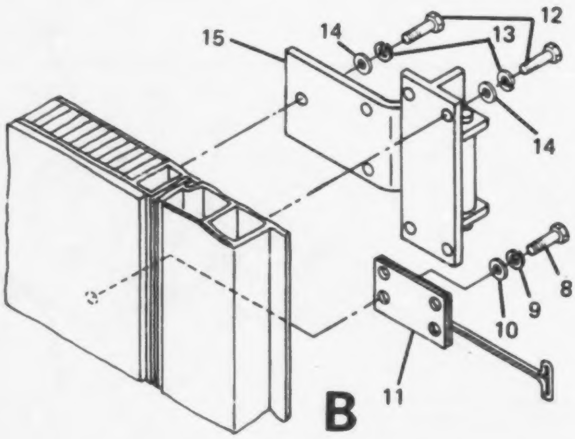
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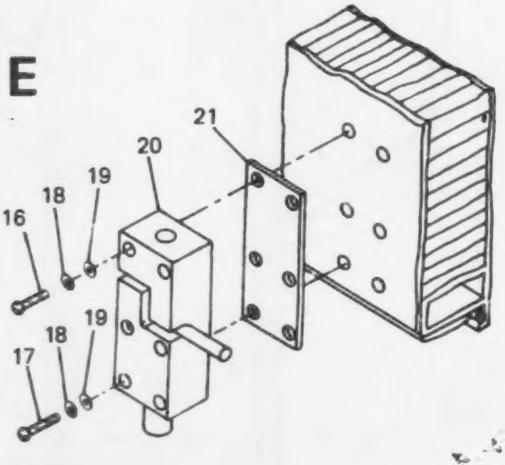
4. Remove screws (16 and 17), lockwashers (18), and washers (19) securing foot bolt assembly (20) and spacer (21) to door.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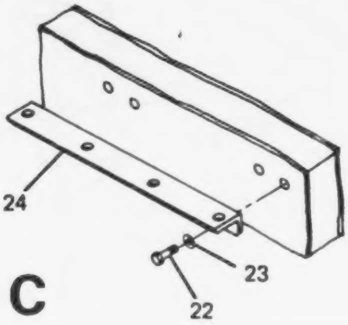
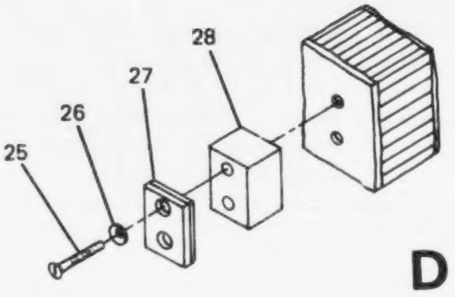
4-18. (cont)

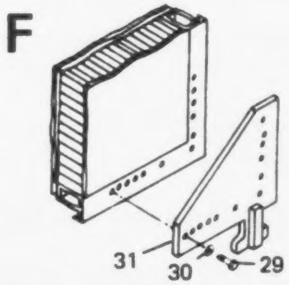


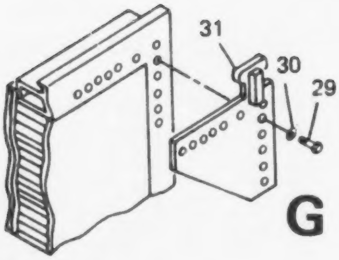


5. Remove screws (22) and lockwashers (23) securing jack stowage angle (24) to door.

6. Remove screws (25) and lockwashers (26) securing jack support bracket (27) and spacer (28) to door.

7. Remove screws (29) and lockwashers (30) securing shear plate (31) to door.

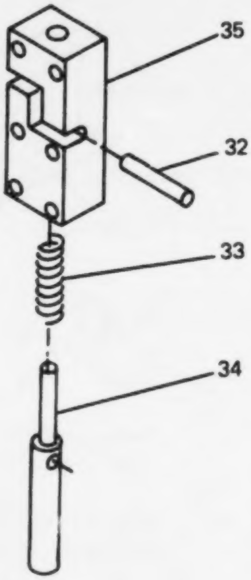




Door Vent

Refer to paragraph 4-17.

4-18. (cont)



Foot Bolt Assembly

8. Remove spring pin (32) from housing (35).

9. Remove shaft (34) and compression spring (33) from housing (35).

CLEANING, INSPECTION

1. Clean panel and component surfaces.

2. Inspect mounting surfaces for corrosion and damage.

3. Inspect for and replace if necessary:

   a. Missing or damaged components

   b. Corrosion or paint damage.

REPAIR

1. Panel skin damage. (Refer to paragraph 4-32 through 4-43).

2. Corrosion or paint damage. (Refer to paragraph 4-44)

ASSEMBLY

Foot Bolt Assembly

1. Install compression spring (33) and shaft (34) in housing (35).

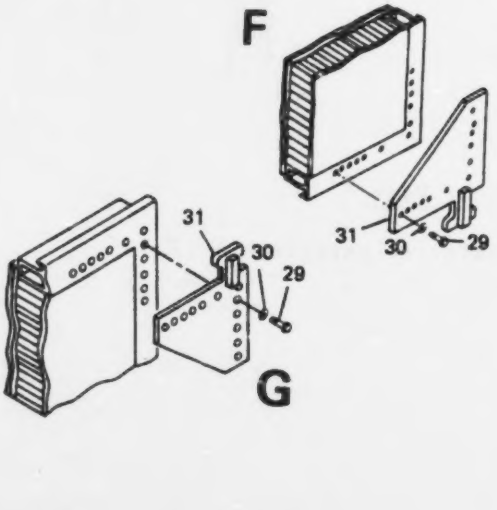
2. Compress spring slightly until spring pin hole aligns with slot. Install spring pin (32) in housing (35).

Door Vent

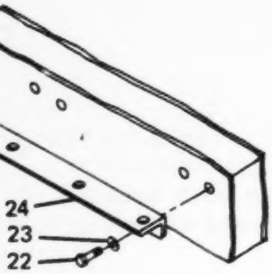
Refer to paragraph 4-17.

Left Cargo Door

3. Position shear plate (31) on door and install lockwashers (30) and screws (29).



4-18. (cont)



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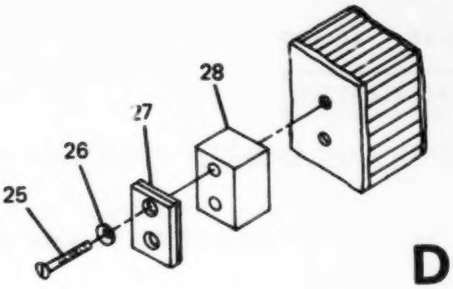
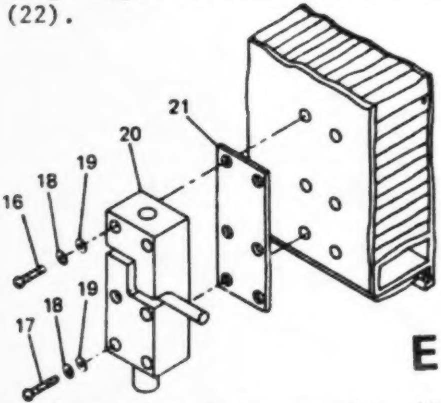


D

4. Position spacer (28) and jack support bracket (27) on door and install lockwashers (26) and screws (25).

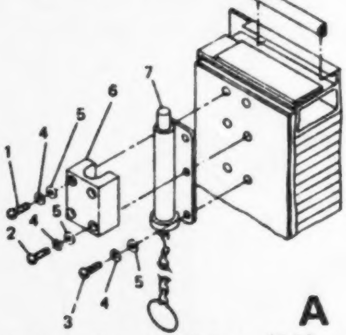
5. Position jack stowage angle (24) on door and install lockwashers (23) and screws (22).



E

6. Position spacer (21) and foot bolt assembly (20) on door and install washers (19), lockwashers (18), and screws (16 and 17).

7. Position hinge plate (15) on door and install washers (14), lockwashers (13), and bolts (12).



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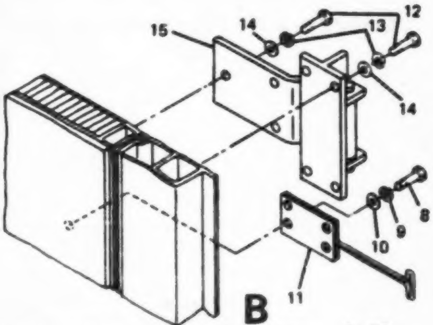


B

8. Position door holder (11) on door and install washers (10), lockwashers (9), and screws (8).

9. Position chain bolt (7) and chain bolt housing (6) on door and install washers (5), lockwashers (4), and screws (1, 2 and 3).

10. Seal (paragraph 4-43)

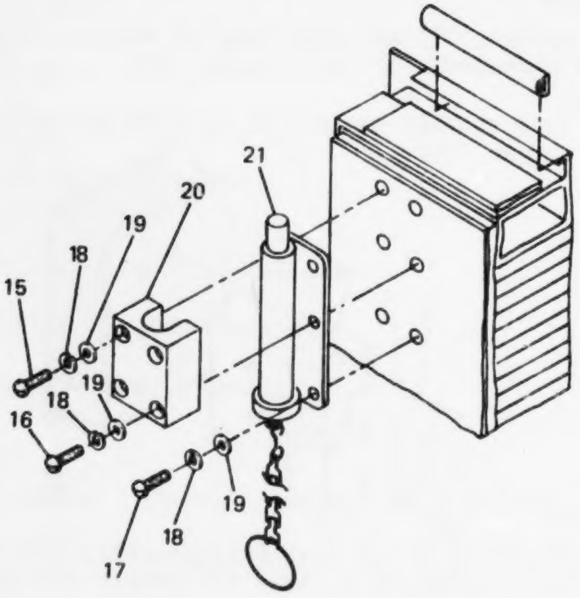
11. Refinish (paragraph 4-44).

4-18. (cont)

INSTALLATION

Chain Bolt Assembly

1. Secure chain bolt (21) and chain bolt housing (20) to door with six washers (19), lockwashers (18), and screws (15, 16, 17).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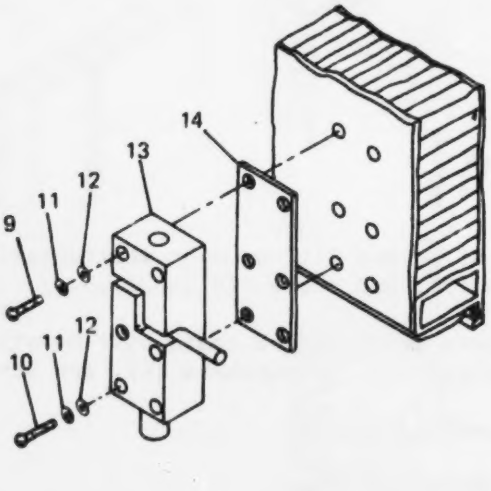
Foot Bolt Assembly

2. Secure spacer (14) and foot bolt assembly (13) to door with six washers (12), lockwashers (11), and screws (9 and 10).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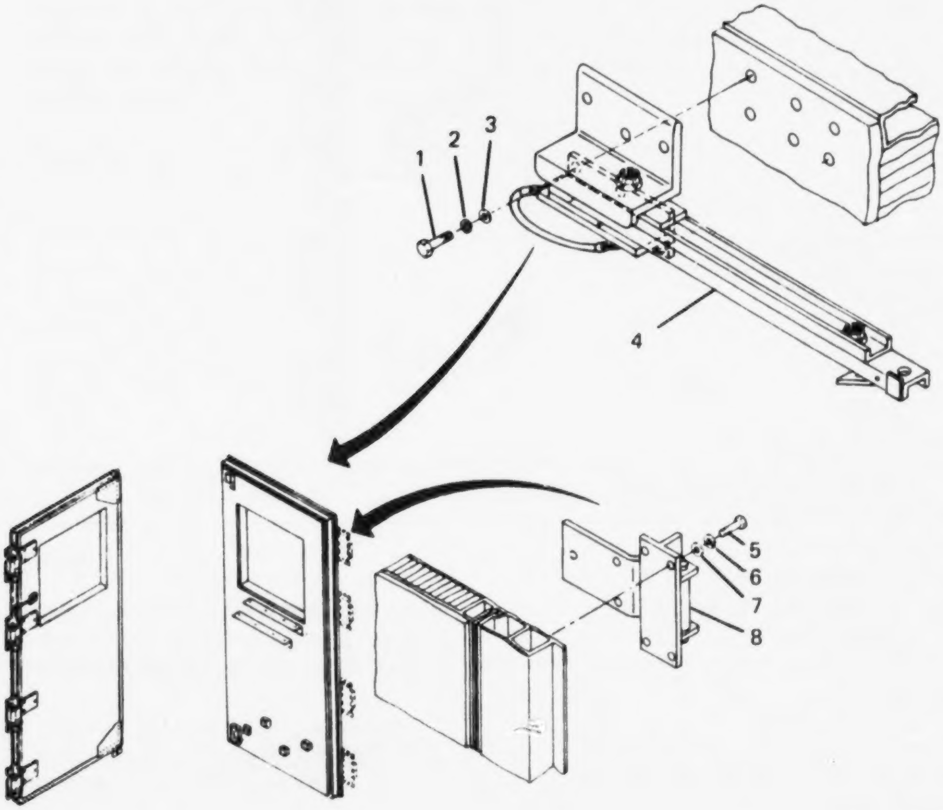
4-18. (cont)

Left Cargo Door

3. Secure each of four hinge base plates (8) to endwall with four washers (7), lockwashers (6), and bolts (5).

4. Secure door stop (4) to endwall with three washers (3), lockwashers (2), and bolts (1).



ALIGNMENT

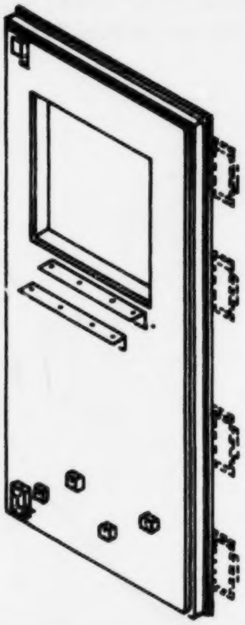
Foot Bolt Assembly

Add shims as necessary between foot bolt assembly and door to properly align foot bolt assembly.

4-18. (cont)

Left Cargo Door

Loosen hinge bolts and place a wedge in the area of the door to take up any slack and align the door properly. Tighten hinge bolts.



4-19. HINGED PANEL LEVELING JACK ASSEMBLY SERVICE AND REPAIR

This task covers:

- a. Disassembly
- b. Cleaning, Inspection
- c. Repair
- d. Lubrication
- e. Assembly

INITIAL SETUP

Standard tools
General mechanics tool kit
Grease gun

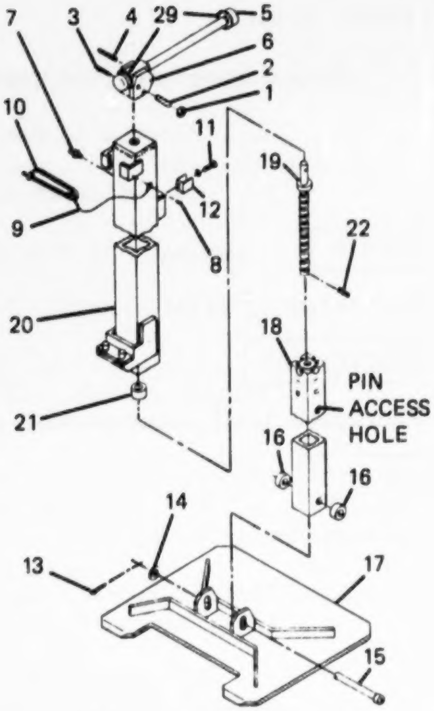
Materials
Grease, Item 12, Appendix E

DISASSEMBLY

Jack Assembly

1. Remove nut (1), spring plunger (2), and lower pin (3).
2. Remove upper pin (4) and separate handle (5) from support (6).
3. Remove grease fitting (7).
4. Remove rivet (8) to remove lanyard (9) and safety pin (10).

4-19. (cont)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PIN ACCESS HOLE
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NOTE

Do not remove lanyard unless pins or cables are damaged.

5. Remove screws (11) and spring tension clip (12).

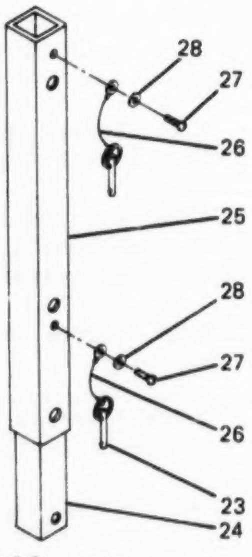
6. Remove cotter pin (13), washer (14), pin (15), and spacers (16) to remove base (17) from basic jack.

7. Remove inside tube (18) and jack screw (19) from outside tube (20).

8. Remove bearing (21).

9. Drive pin (22) out through access hole and remove jack screw (19) from inside tube (18)

10. Remove O-rings (29) from handle (5).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Jack Extension

11. Remove quick-disconnect pins (23) and remove inside tube (24) from outside tube (25).

12. Remove screw (27), washer (28), and lanyard (26).

NOTE

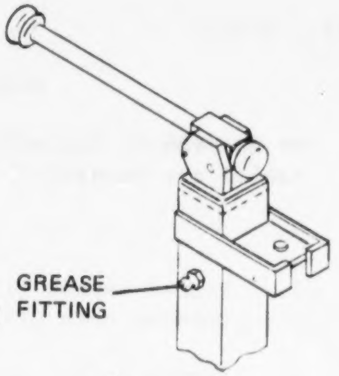
Do not remove lanyards unless pins or cables are damaged.

CLEANING, INSPECTION

1. Clean jack assembly and component surfaces.

2. Inspect mounting surfaces for corrosion and damage.

4-19. (cont)


GREASE FITTING

3. Inspect for and replace if necessary:

   a. Missing or damaged components

   b. Corrosion or paint damage.

REPAIR

Corrosion or paint damage. (Refer to paragraph 4-44)

LUBRICATION

Lubricate jack assembly with grease.

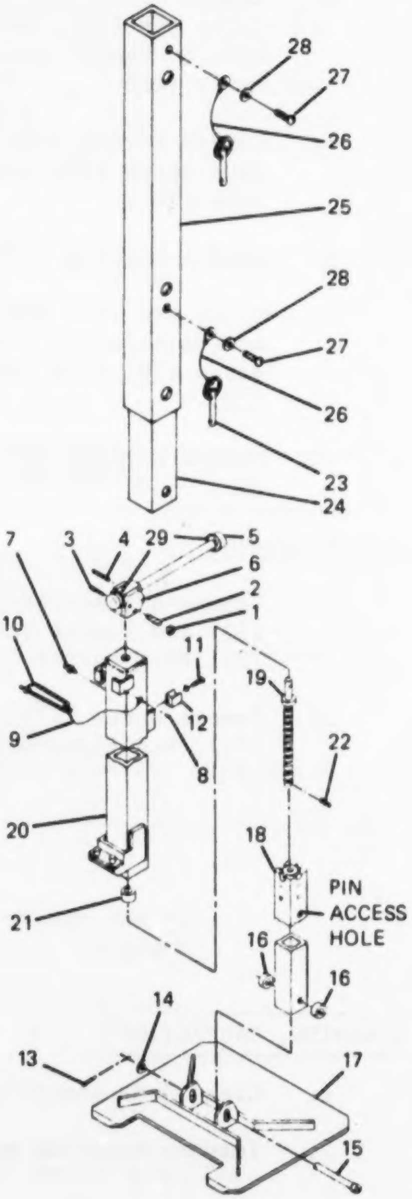
ASSEMBLY

Jack Extension

1. Install lanyard (26), washer (28), and screw (27).
2. Install inside tube (24) in outside tube (25) and secure with quick-disconnect pins (23).

Jack Assembly

3. Install jack screw (19) in inside tube (18).
4. Align hole in jack screw (19) with access hole in inside tube (18) and install pin (22).
5. Pack bearing (21) with grease and place on jack screw (19).
6. Install inside tube (18) in outside tube (20).
7. Position spring tension clip (12) on outside tube (20) and install screws (11).
8. Assemble O-rings (29) on handle (5).
9. Position handle (5) in support (6) and on jack screw (19) with holes in handle yoke and jack screw aligned. Install pins (3 and 4).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PIN ACCESS HOLE
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4-19. (cont)

10. Install spring plunger (2) in handle yoke and secure with nut (1). Adjust nut to control handle movement.

11. Position basic jack on base (17) with spacers (16) and secure with pin (15), washer (14), and new cotter pin (13).

12. Install grease fitting (7) and lubricate jack with grease.

4-20. HINGED ROOF PANEL SERVICE, REPLACEMENT, REPAIR, AND ALIGNMENT

This task covers:

a. Lubrication	e. Repair
b. Removal	f. Assembly
c. Disassembly	g. Installation
d. Cleaning, Inspection	h. Alignment

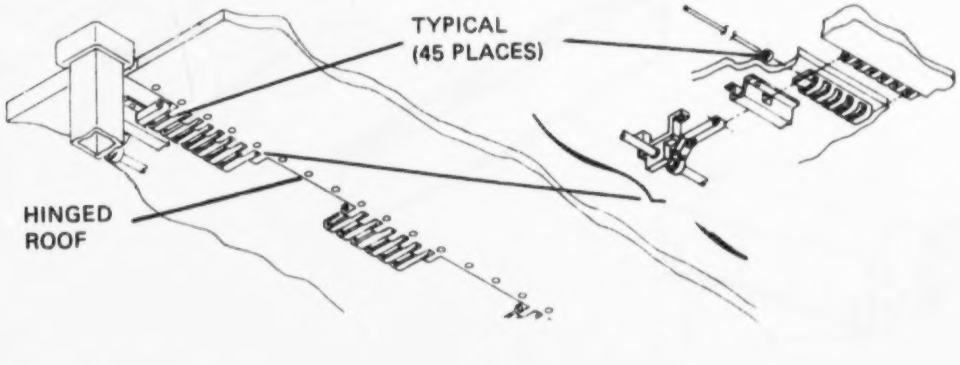
INITIAL SETUP

Special Tools
  Hand blind riveter, Appendix B, Item 2
Standard Tools
  General mechanics tool kit
Personnel - 4
  1 Electrician
Materials
  Adhesive, Item 2, Appendix E
  Adhesive, Item 3, Appendix E
  Sealant, Item 18, Appendix E
  Silicone Grease, Item 23, Appendix E

Equipment Condition
  Hinged endwalls removed, paragraph 4-21
  Hinged roof area ceiling lights removed, paragraph 3-5

LUBRICATION

Lubricate rollers on hinged roof panel with a coat of silicone grease annually.



4-20. (cont)

REMOVAL

Hinged Roof Panel

WARNING

The shelter contains voltages that are dangerous if contacted. Before removing or installing electrical cables or components, make certain electrical power is completely disconnected from circuit involved.

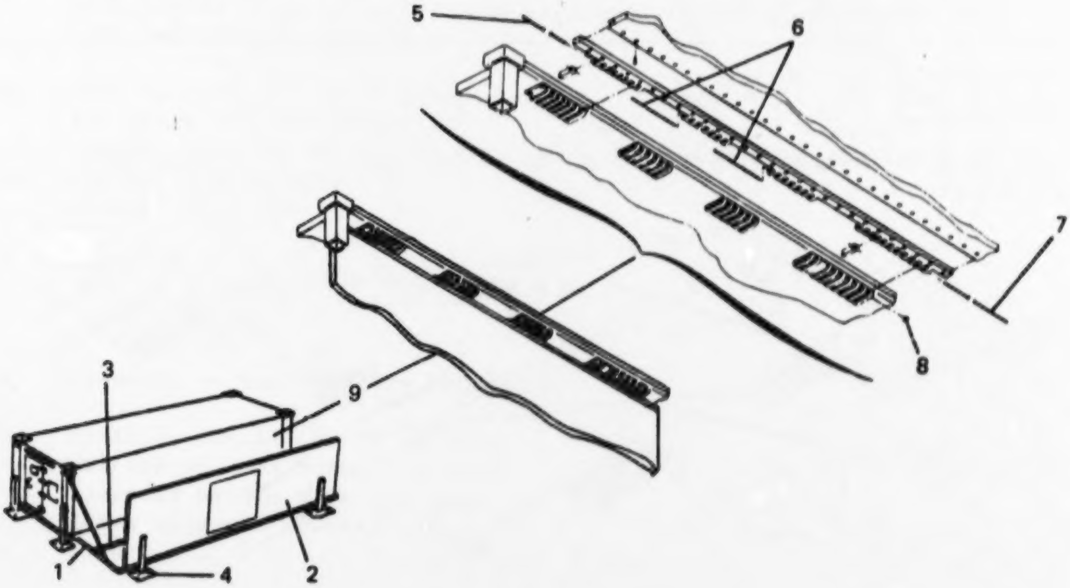
CAUTION

Support braces must be installed for this operation.

NOTE

Remove only those electrical components that will interfere with removal of a particular panel.

1. Set main circuit breaker to off position.
2. Lower hinged floor (1).

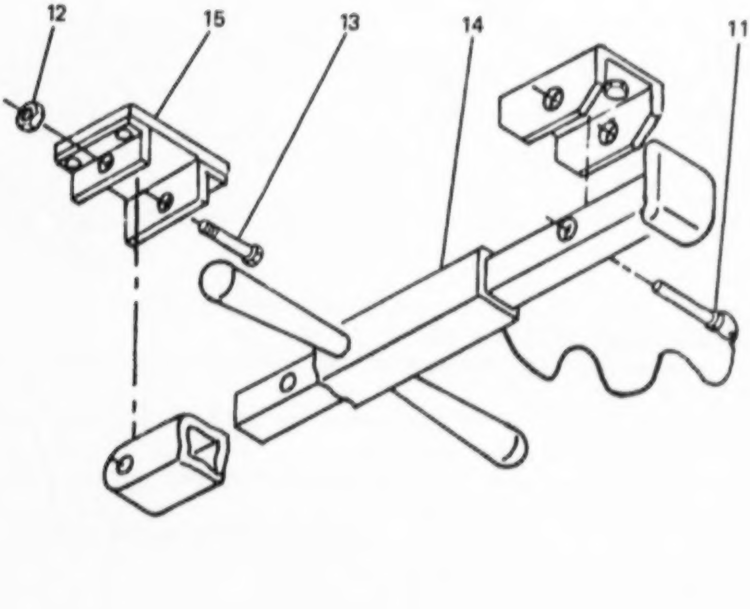


4-20. (cont)

3. Raise hinged sidewalls (2) and install support braces (3).
4. Position leveling jacks (4).
5. Support hinged roof (9) in stowed position, straighten ends of hinge pin first, and remove hinge pins (5, 6, and 7) and rollers (8).
6. Remove hinged roof (9).

Support Strut Assembly

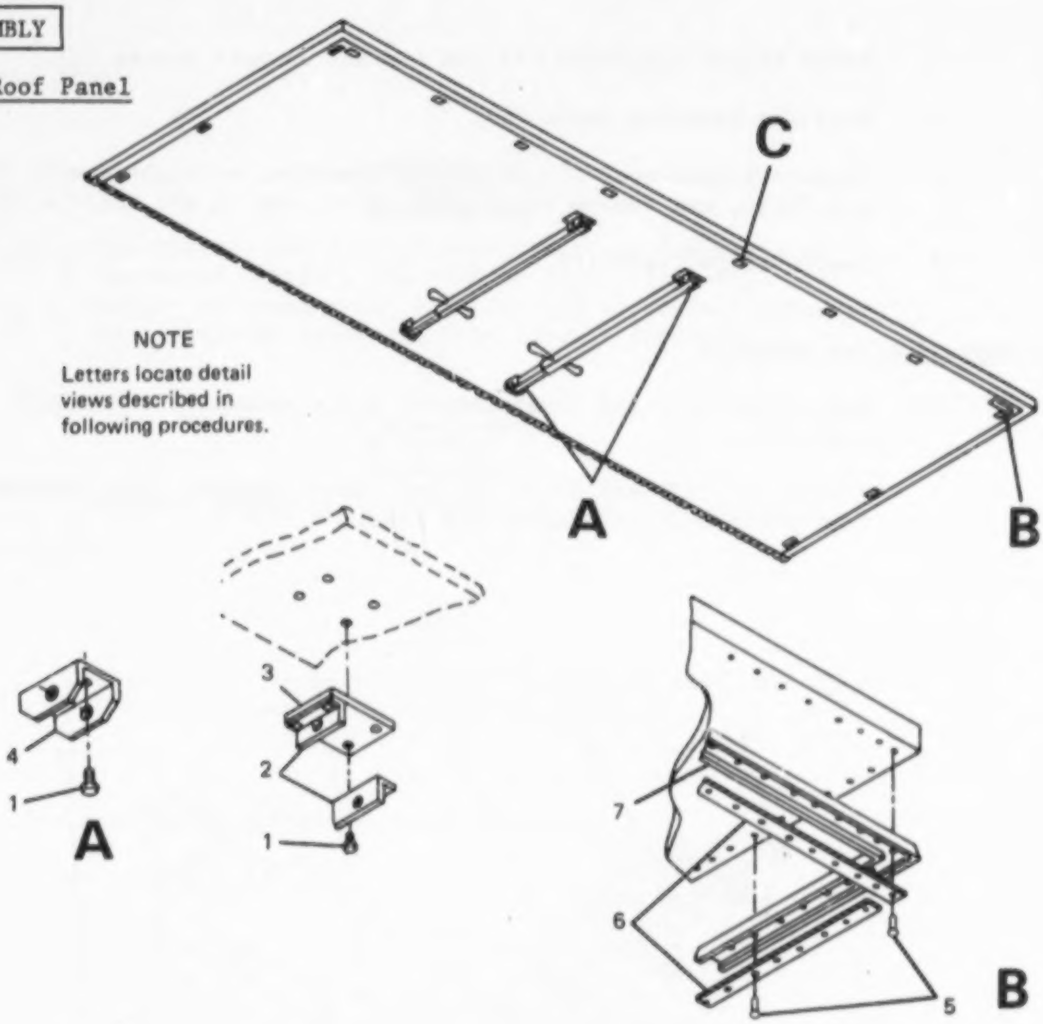
7. Remove pin (11) and lower support strut assembly to vertical position.
8. Remove nut (12) and bolt (13) and remove support strut assembly (14) from plate (15) on hinged roof panel.



4-20. (cont)

DISASSEMBLY

Hinged Roof Panel



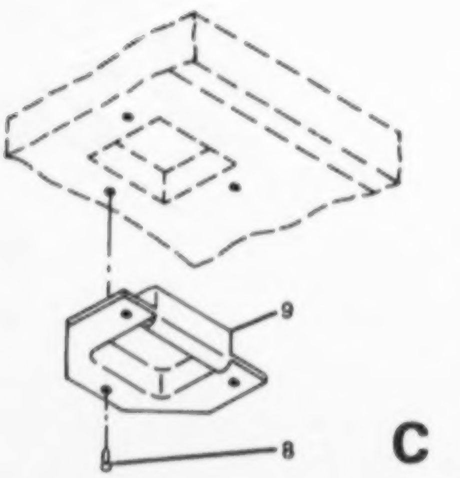
NOTE
Letters locate detail views described in following procedures.

1. Remove screws (1), angles (2), plate (3) and bracket (4) from roof.

2. Drill out rivets (5) securing seal retainer strips (6). (Refer to paragraph 4-33)

3. Remove seal (7). (Refer to paragraph 4-41)

4. Drill out rivets (8) and remove strike cup (9). (Refer to paragraph 4-33)



4-20. (cont)

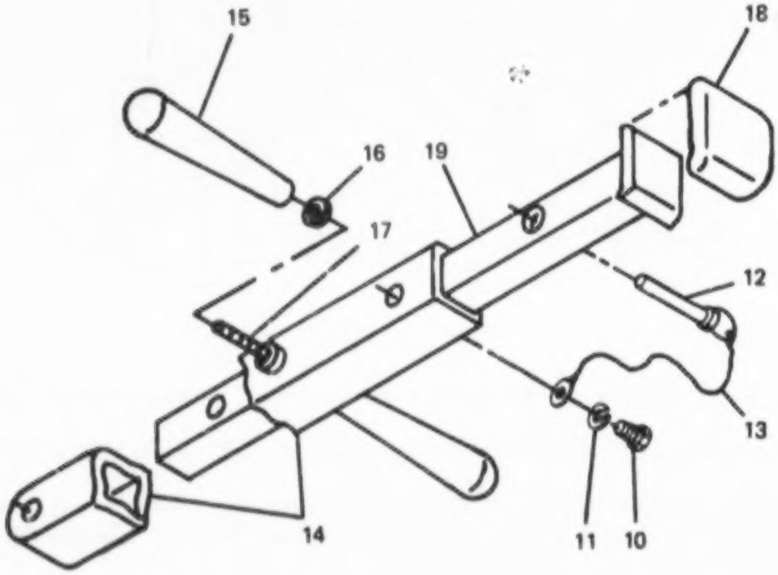
Support Strut Assembly

5. Remove screw (10) and washer (11) and remove pin (12) and lanyard (13) from outer tube assembly (14).

6. Remove tapered handles (15), lockwashers (16), and handle shafts (17) by unscrewing.

7. Remove pad (18) from inner tube assembly (19).

8. Remove outer tube assembly (14) from inner tube assembly (19).



CLEANING, INSPECTION

1. Clean panel and component surfaces.

2. Inspect mounting surfaces for corrosion and damage.

3. Inspect for and replace if necessary:

    a. Missing or damaged components

    b. Corrosion or paint damage.

REPAIR

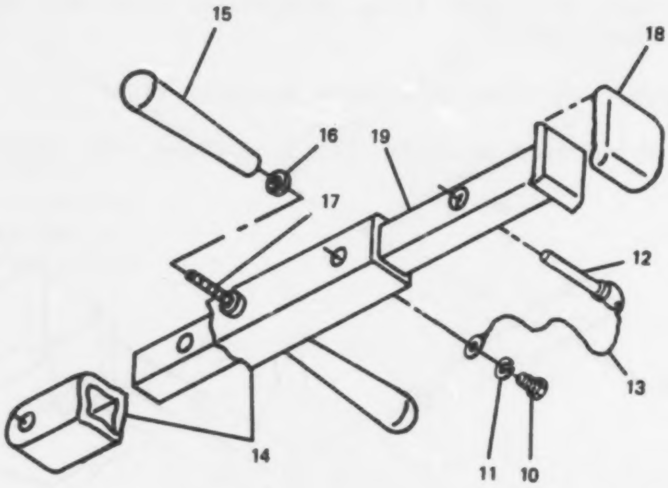
1. Panel skin damage. (Refer to paragraphs 4-32 through 4-43)

2. Corrosion or paint damage. (Refer to paragraph 4-44)

4-20. (cont)

ASSEMBLY

Support Strut Assembly



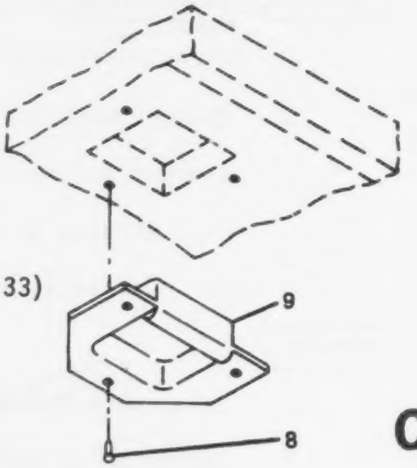
1. Install inner tube assembly (19) in outer tube assembly, (14).

2. Attach pad (18) to inner tube assembly (19) with adhesive.

3. Install handle shafts (17) and lockwashers (16) in outer tube assembly (14) and mount tapered handles (15) on handle shafts (17).

4. Assemble pin (12) and lanyard (13) to outer tube assembly (14) with screw (10) and washer (11).

Hinged Roof Panel



5. Coat strike cup (9) mating surface and roof panel mounting area with adhesive.

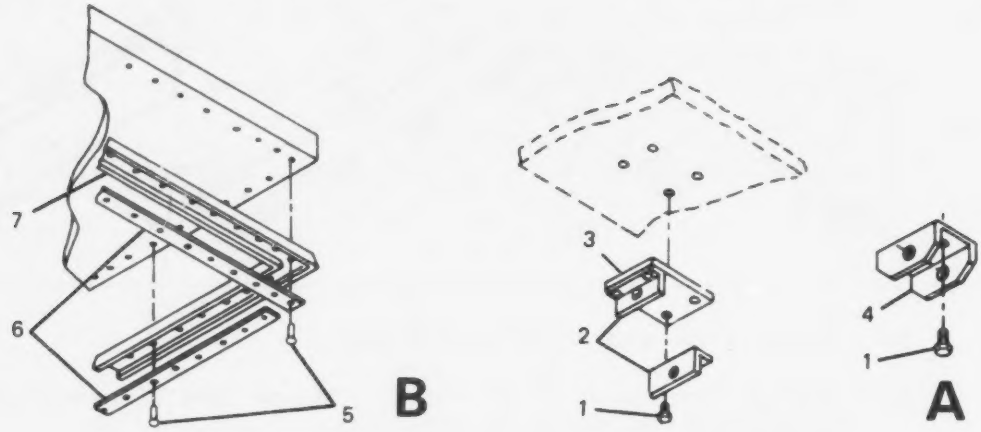
6. Position strike cup (9) and install rivets (8). (Refer to paragraph 4-33)

7. Install seal (7) and retainer strips (6) with rivets (5). (Refer to paragraph 4-41)

4-20. (cont)

8. Coat bracket (4) and plate (3) and roof panel mounting area with adhesive.

9. Position bracket (4), plate (3), and angles (2) on roof panel and install screws (1).

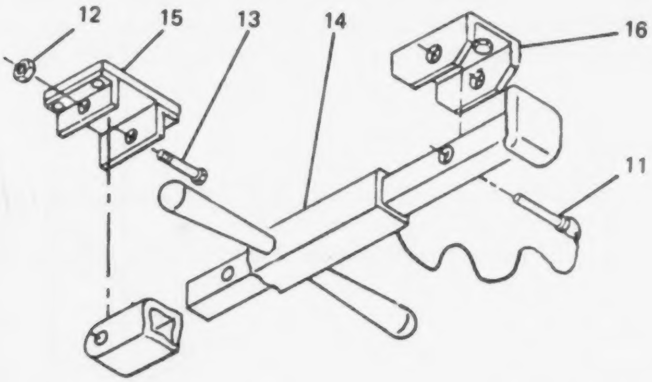


INSTALLATION

Support Strut Assembly

1. Secure support strut assembly (14) to plate (15) on hinged roof panel with bolt (13) and nut (12).

2. Raise support strut assembly to horizontal position in strut support bracket (16) on hinged roof panel and install pin (11).

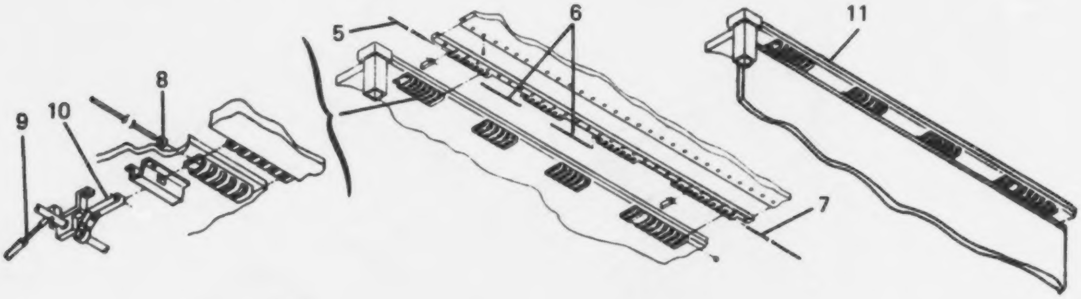


4-20. (cont)

Hinged Roof Panel

3. Coat rollers (8) with silicone grease to hold rollers in place and position rollers in fixed roof hinges.

4. Lift and support hinged roof (11) in stowed position.



5. Engage hinge with fixed roof hinges.

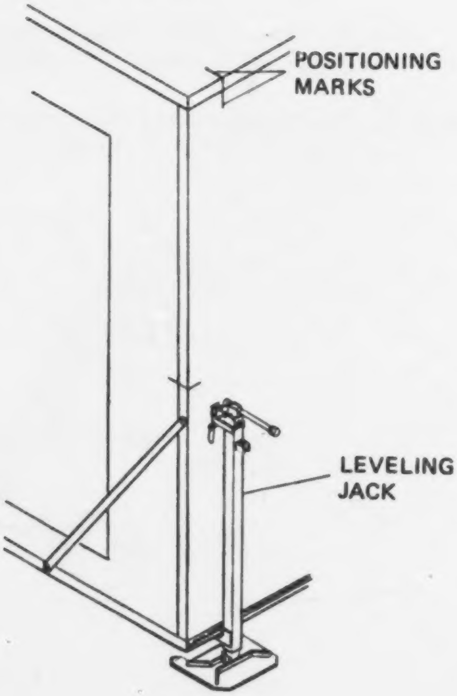
6. Install hinge pins (5, 6, and 7). Ensure that hinge pins go through rollers (8) and solar bar rods (10).

7. Bend each end of hinge pins approximately 15 degrees to prevent slippage.

8. Push two handles of solar bar (9) simultaneously to slide hinged roof back and forth to check freedom of movement.

ALIGNMENT

Adjust leveling jacks to make sure positioning marks on hinged roof and hinged sidewall are properly aligned. Alignment marks on hinged endwall and hinged sidewall must also align at the same time.



4-21. HINGED ENDWALL REPLACEMENT AND REPAIR

This task covers:

a. Removal	d. Repair
b. Disassembly	e. Assembly
c. Cleaning, Inspection	f. Installation

INITIAL SETUP

Special Tools
Hand blind riveter, Appendix B, Item 2
Standard tools
General mechanics tool kit
Personnel - 4
1 Electrician

Equipment Condition
Closeout panel removed from hinged endwall
Materials
Adhesive, Item 2, Appendix E
Sealing Compound, Item 19, Appendix E

NOTE

The following procedures apply to left and right hinged endwalls.

REMOVAL

Hinged Endwall

WARNING

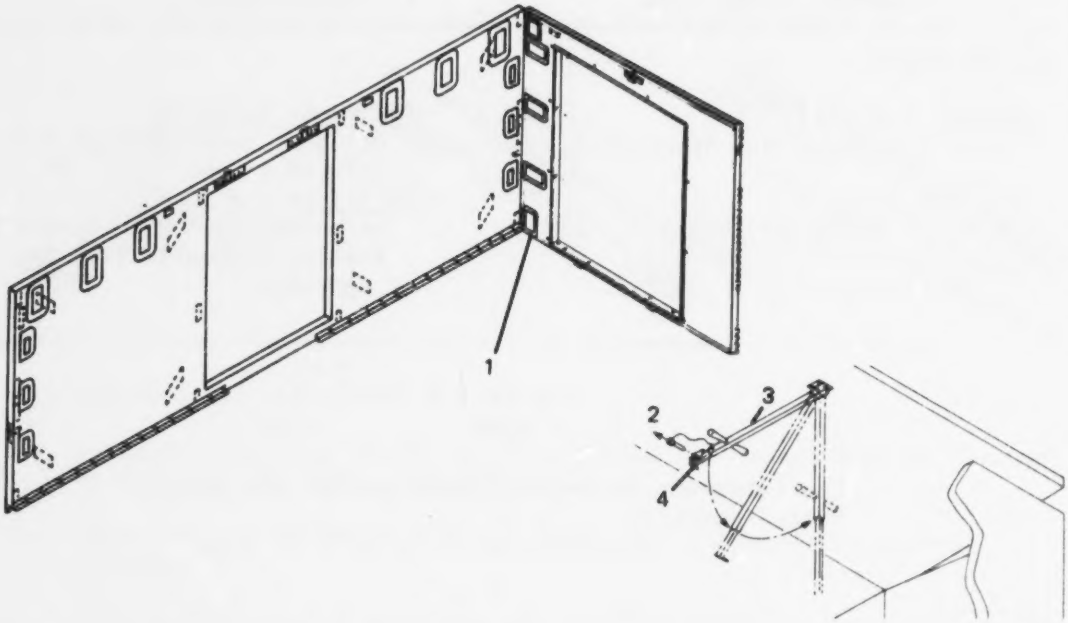
The shelter contains voltages that are dangerous if contacted. Before removing or installing electrical cables or components, make certain electrical power is completely disconnected from circuit involved.

1. Set circuit breakers CB3 and CB7 or CB5 to OFF position.

2. Move receptacles from hinged endwall and stow out of way.

4-21. (cont)

3. Disengage all latches (1) along hinged sidewall, hinged endwalls, and hinged roof.



CAUTION

Support inner tube while disengaging support strut from stowage bracket.

4. Pull lock pins (2) to free support struts (3) from stowage brackets (4) and swing downward.

5. Insert lock pins (2) to secure struts in extended position.

6. Raise hinged roof to full height of struts.

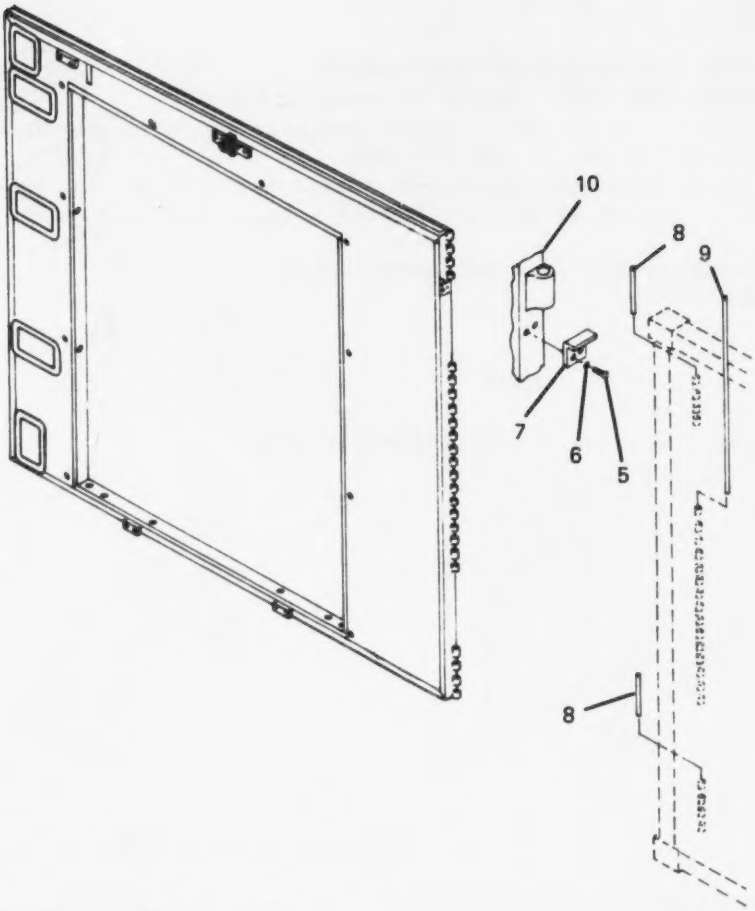
7. Rotate jack handles to lower both expanded side jacks until hinged floor is clear of hinged endwalls.

8. Remove screws (5) and lockwashers (6) and remove pin retainer (7) from hinged endwall (10).

9. Support hinged endwall, straighten lower hinge pins, and remove pins (8) and (9).

10. Remove hinged endwall.

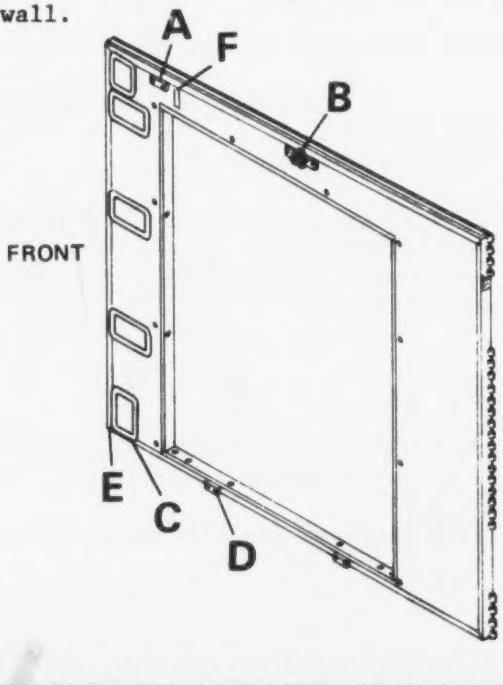
4-21. (cont)



Latch

11. Remove captive screws (11) and latch (12) from hinged endwall.

DISASSEMBLY


A
F
B
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C
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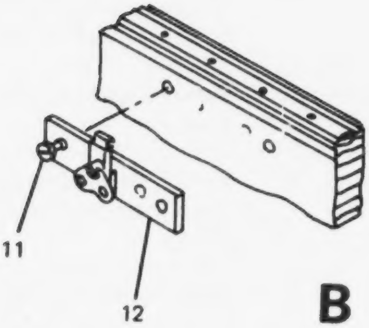


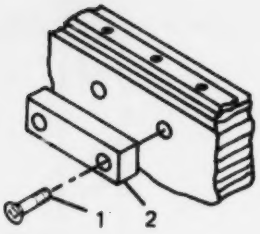
NOTE
Letters locate detail views described in following procedures.

4-21. (cont)

1. Drill out rivets (1) and remove bumper pad (2). (Refer to paragraph 4-33)

2. Remove rivets (3) and (4) and remove latch (5) and latch pan (6). (Refer to paragraph 4-33

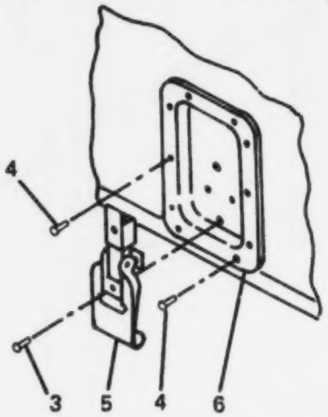
3. Remove screws (7) and remove spacer (8).



A

NOTE

Step 4 applies to left endwalls only.



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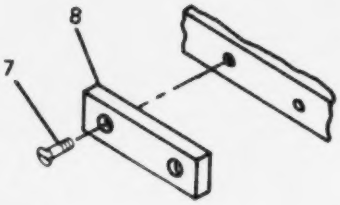


D

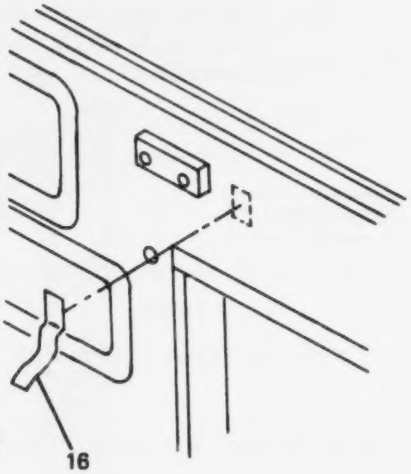
4. Drill out rivets (9) and remove retainer strips (10) and (11). (Refer to paragraph 4-33)

5. Remove seal (12). (Refer paragraph 4-41)

6. Drill out rivets (13) and remove retainer strip (14). (Refer paragraph 4-41)

7. Remove seal (15). (Refer to paragraph 4-33)

8. Remove velcro strap (16).



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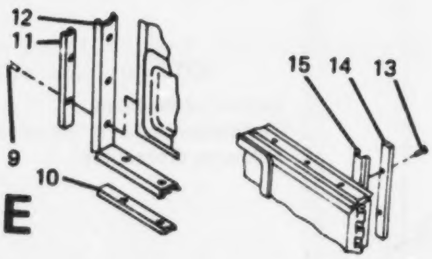


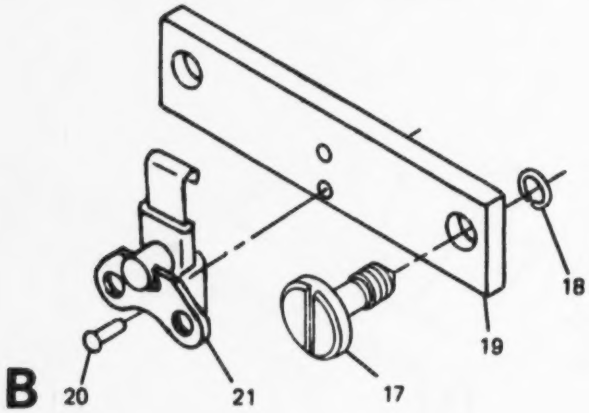
E

4-21. (cont)

Latch

9. Remove screws (17) and retainer washers (18) from latch plate (19).

10. Drill out rivets (20) and remove link lock (21) from latch plate (19). (Refer to paragraph 4-33)



CLEANING, INSPECTION

1. Clean panel and component surfaces.

2. Inspect mounting surfaces for corrosion and damage.

3. Inspect for and replace if necessary:

   a. Missing or damaged components

   b. Corrosion or paint damage.

REPAIR

1. Panel skin damage. (Refer to paragraphs 4-32 through 4-43)

2. Corrosion or paint damage. (Refer to paragraph 4-44)

ASSEMBLY

Latch

1. Position link lock (21) on latch plate (19) and secure with rivets (20). (Refer to paragraph 4-33)

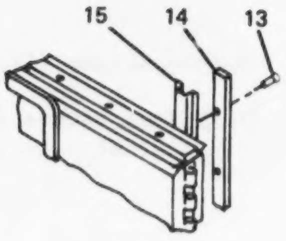
2. Install screws (17) and retainer washers (18) in latch plate (19).

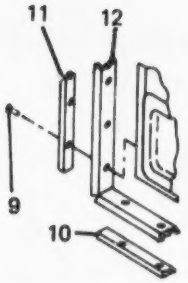
4-21. (cont)

Hinged Endwall

3. Install seal (15) and retainer strip (14) with rivets (13). (Refer to paragraph 4-41)

4. Install seal (12) and retainer strips (10 and 11) with rivets (9). (Refer to paragraph 4-41)





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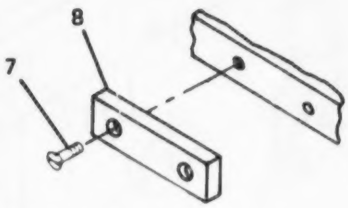

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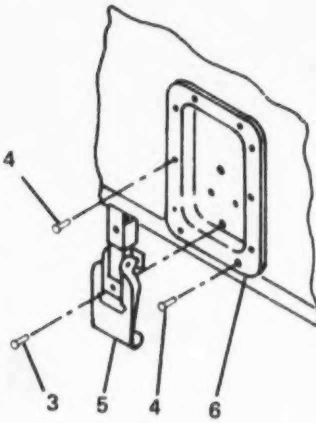


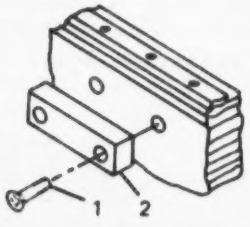
5. Position spacer (8) and install screws (7).

6. Position latch (5) and install rivets (3).

7. Position latch pan (6), bond with adhesive, and install rivets (4). (Refer to paragraph 4-33)

8. Position bumper pad (2) and install rivets (1). (Refer to paragraph 3-

9. Bond velcro strap (16) to endwall panel with adhesive.



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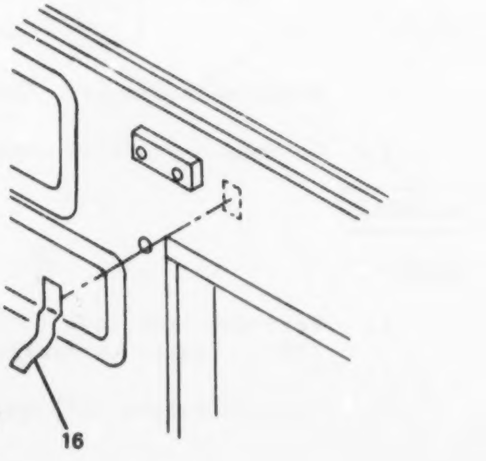


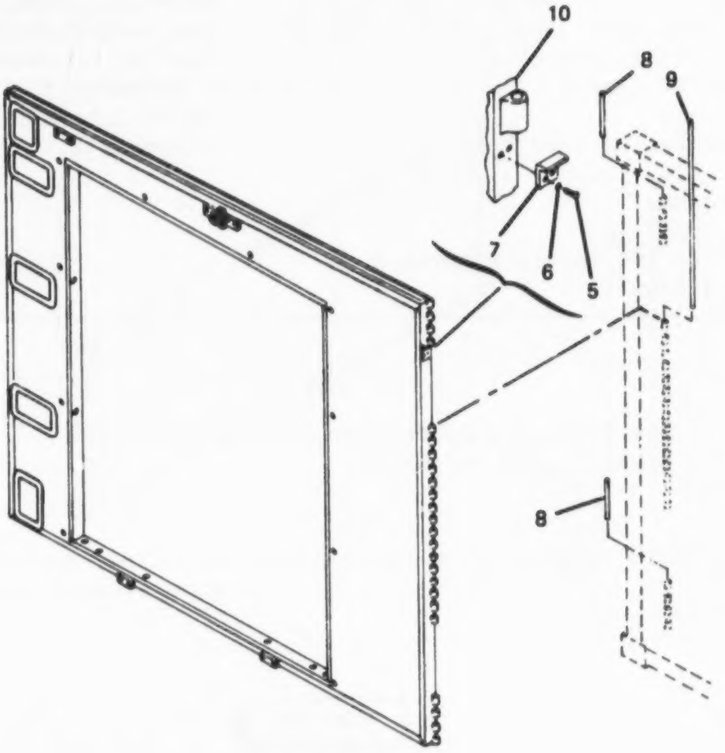
4-21. (cont)

INSTALLATION

1. Position and support hinged endwall to align hinges (10).

2. Install hinge pins (8) and (9). Bend top of center and lower hinge pins approximately 15 degrees.

3. Install pin retainer (7) with lockwashers (6) and screws (5) to secure upper hinge pin.



4. Swing hinged endwall inward and back to check for freedom of movement.

5. Complete extension of expandable side by performing steps x through ae of paragraph 2-12.

6. Move receptacles from temporary stowed position and mount on hinged endwall.

4-22. HINGED SIDEWALL REPLACEMENT AND REPAIR

This task covers:

- a. Removal
- b. Disassembly
- c. Cleaning, Inspection
- d. Repair
- e. Assembly
- f. Installation

INITIAL SETUP

Special Tools

Hand blind riveter, Appendix B, Item 2
Snap ring pliers, Appendix B, Item 10
Installation tool, Appendix B, Item 3
Installation tool, Appendix B, Item 14
Electric drill, portable, Appendix B, Item 6

Standard Tools

General mechanics tool kit

Personnel - 4

1 Electrician

Equipment Condition

Closeout and ECU panels removed from hinged sidewalls

Materials

Adhesive, Item 1, Appendix E
Adhesive, Item 2, Appendix E
Adhesive, Item 3, Appendix E
Sealant, Item 18, Appendix E
Sealing Compound, Item 19, Appendix E
Spray Lubricant, Item 25, Appendix E

NOTE

The following procedures apply to left and right hinged sidewalls.

REMOVAL

Hinged Sidewall

WARNING

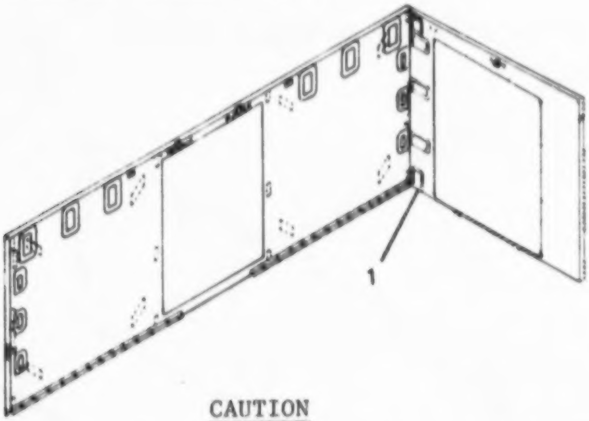
The shelter contains voltages that are dangerous if contacted. Before removing or installing electrical cables or components, make certain electrical power is completely disconnected from circuit involved. Support cables must be locked out prior to removal of hinged sidewall.

NOTE

Remove only those electrical components that will interfere with removal of a particular panel.

4-22. (con)

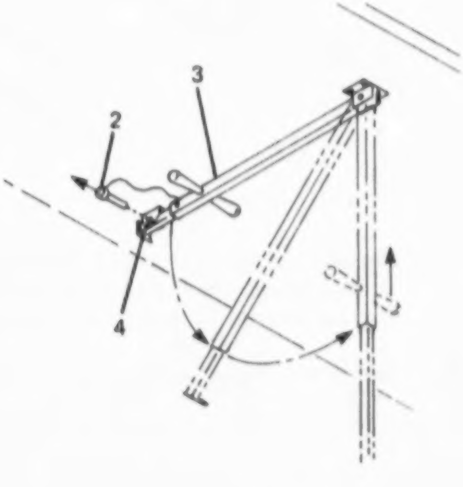
1. Install support braces.
2. Set circuit breaker CB3 and CB7 or CB5 to OFF position.
3. Move receptacle assemblies and stow on hinged endwall.
4. Set circuit breaker CB6 to OFF position.
5. Disconnect and remove three hinged roof area ceiling lights. Stow light assemblies in fixed ceiling storage brackets. (Refer to paragraph 3-5)
6. Disengage all latches (1) along hinged sidewall, hinged endwalls, and hinged roof.
7. Remove all removable latches and retain.



CAUTION

Support inner tube while disengaging support strut from stowage bracket.

8. Pull lock pins (2) to free support struts (3) from stowage brackets (4) and swing downward.
9. Insert lock pins (2) to secure struts in extended position.



4-22. (cont)

10. Raise hinged roof to full height of struts.

11. Rotate jack handles to lower both expanded side jacks until hinged floor is clear of hinged endwalls.

12. Swing both hinged endwalls inward to stowed positions.

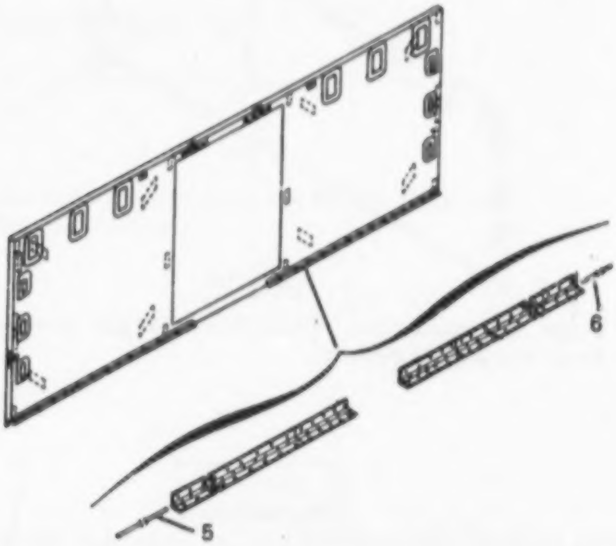
13. Lower hinged roof.

14. Stow support struts on hinged roof.

15. Slide hinged roof inward with solar bar.

16. Lower jacks to disengage from jack support brackets on hinged sidewall.

17. Lower hinged sidewall to hinged floor.



18. Remove hinge pins (5) and (6) by first lubricating with spray lubricant, then driving it toward the center. Use a variable speed drill motor to pull the hinge pin all the way out of the hinge.

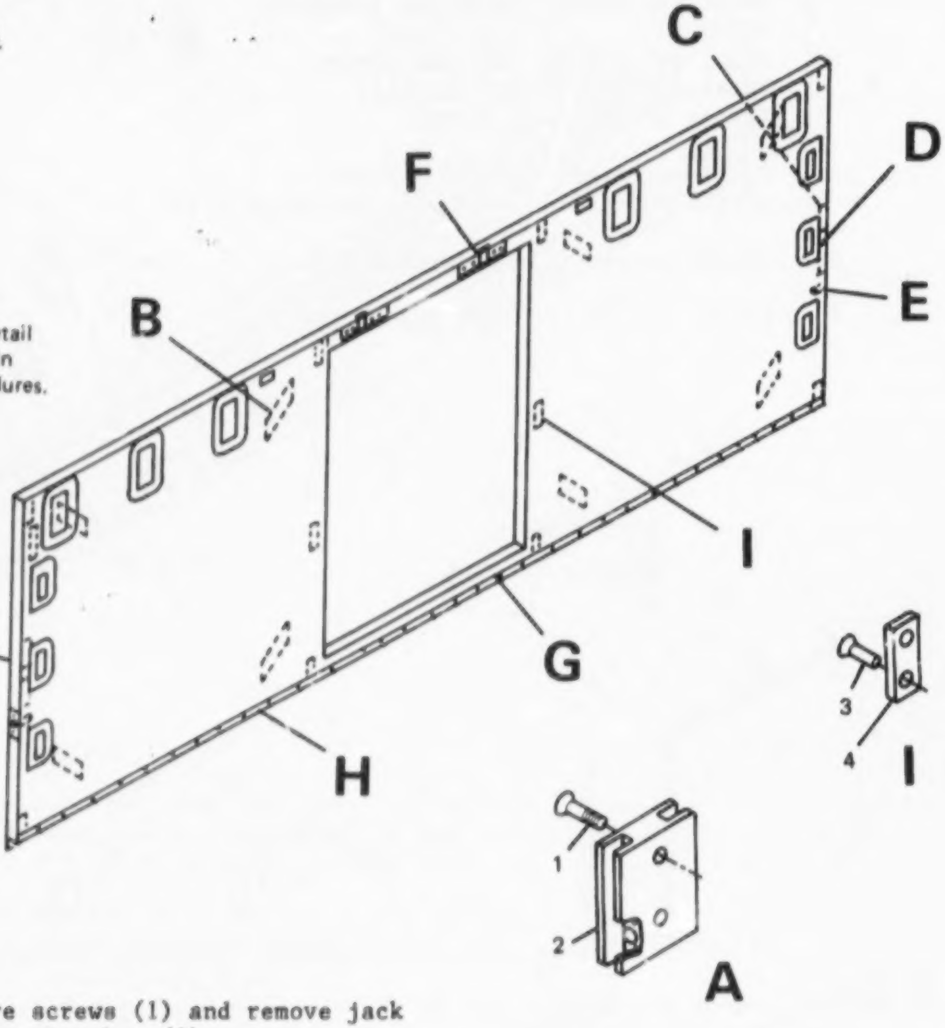
19. Remove hinged sidewall.

4-22. (cont)

DISASSEMBLY

Hinged Sidewall

NOTE
Letters locate detail views described in following procedures.

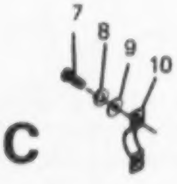


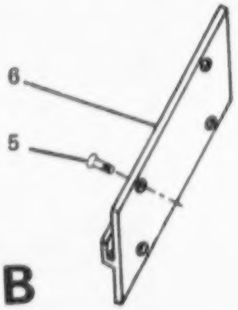
1. Remove screws (1) and remove jack support bracket (2).

2. Drill out rivets (3) and remove bumper pad (4). Refer to paragraph 4-33)

3. Remove screws (5) and remove stowage bracket (6). (Right hinged sidewall only.)

4. Remove bolts (7), lockwashers (8), and washers (9) and remove strap (10).





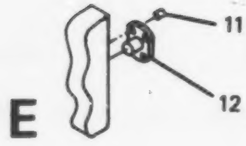
4-22. (cont)

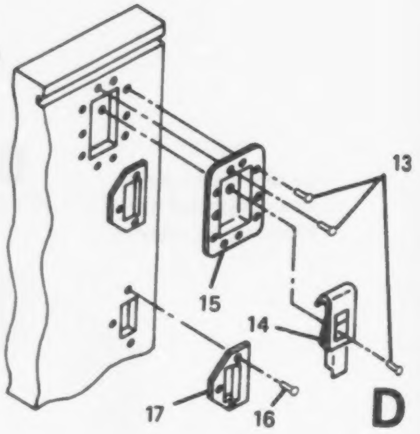
5. Drill out rivets (11) and remove brace cup (12). (Refer to paragraph 4-33)
6. Drill out rivets (13) and remove latch (14) and latch pan (15). (Refer to paragraph 4-33)

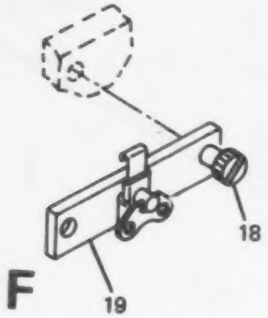
7. Drill out rivets (16) and remove strike cup (17). (Refer to paragraph 4-33)

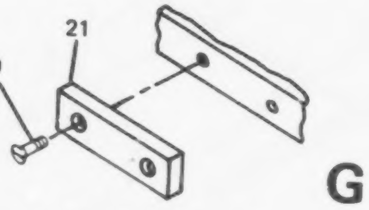
8. Remove screws (18) and latch (19).

9. Remove screws (20) and spacer (21).









10. Drill out three rivets at threshold. (Refer to paragraph 4-33)

11. Remove hinge pins (22) by first lubricating with silicone grease, then driving it out toward the center part way. Use a drill motor to pull the hinge pin all the way out of the hinge.

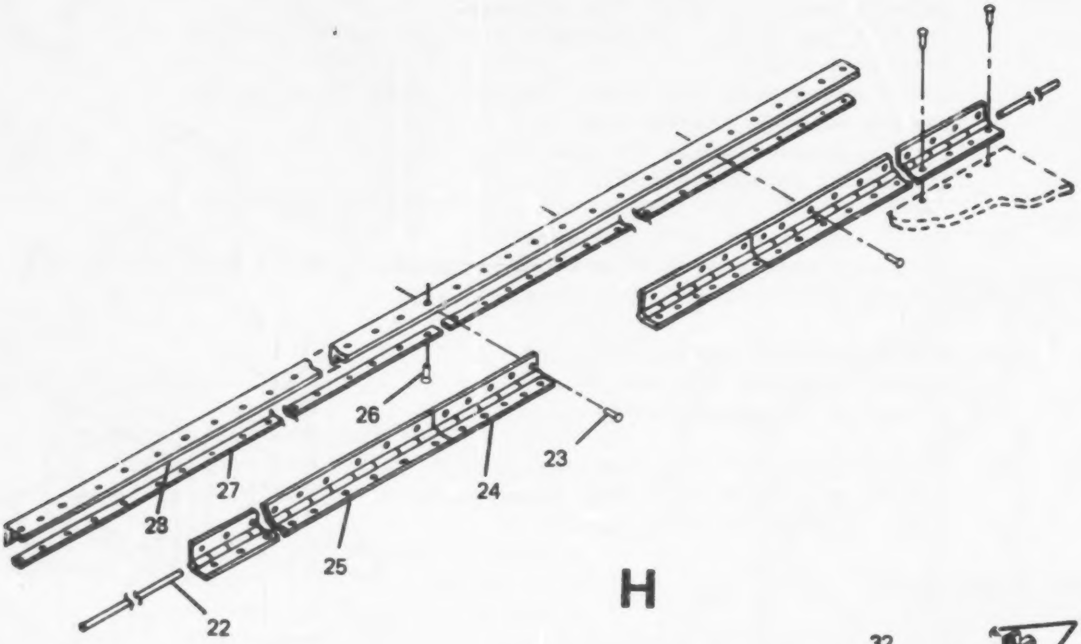
12. Drill out rivets (23) and remove hinges (24 and 25). (Refer to paragraph 4-33)

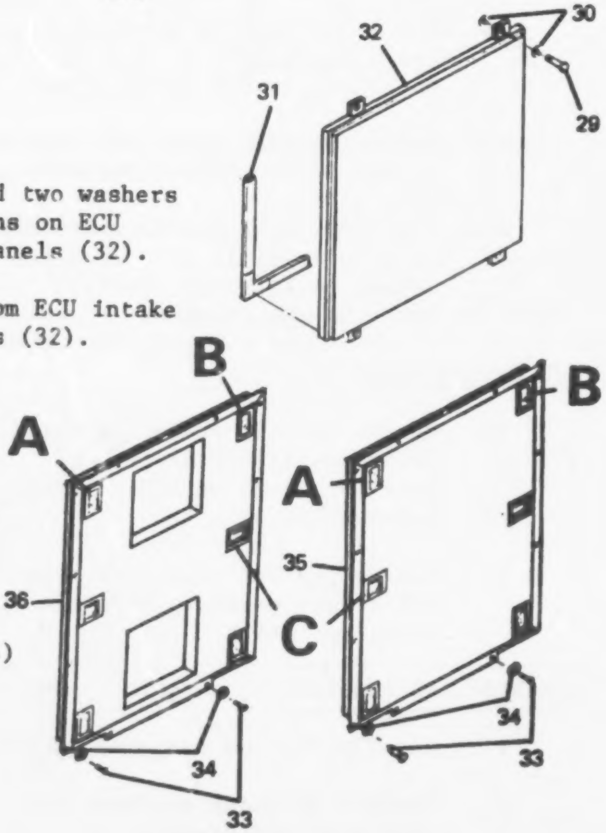
NOTE

The rivets on each end of the hinges are special high strength rivets and require the use of installation tool.

13. Drill out rivets (26) and remove retainer strip (27) and seal (28). (Refer to paragraph 4-41)

4-22. (cont)





Sidewall Closeout Panels

14. Remove captive screw (29) and two washers (30) at each of four locations on ECU intake and return closeout panels (32).

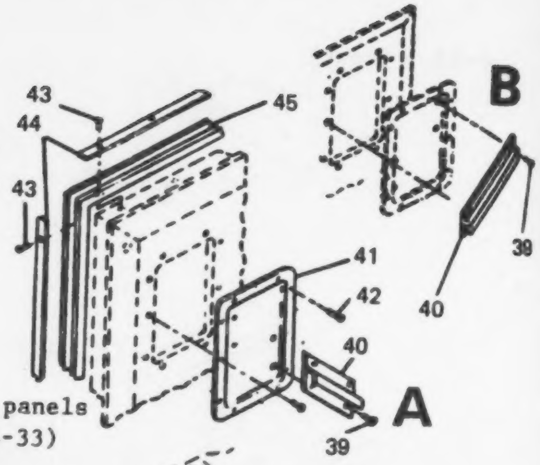
15. Remove weather seals (31) from ECU intake and/or return closeout panels (32). (Refer to paragraph 4-41)

16. Remove screws (33) and using snap ring pliers remove retaining rings (34) from closeout panels (35 and 36).

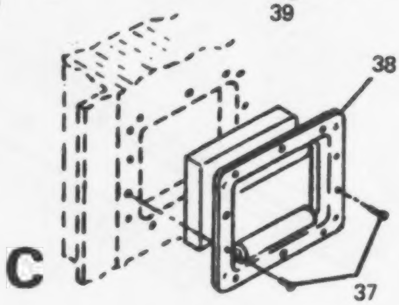
17. Drill out rivets (37) and remove recessed handle (38) from closeout panels (35 and 36). Refer to paragraph 4-33)

4-22. (cont)

18. Drill out rivets (39) and remove stowage brackets (40) from stowage bracket pan (41). (Refer to paragraph 4-33)
19. Drill out rivets (42) and remove stowage bracket pan (41) from closeout panels (35 and 36). (Refer to paragraph 4-33)
20. Drill out rivets (43) and remove retainer strips (44) from closeout panels (35 and 36). (Refer to paragraph 4-33)

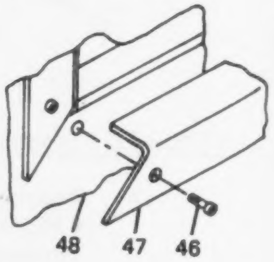


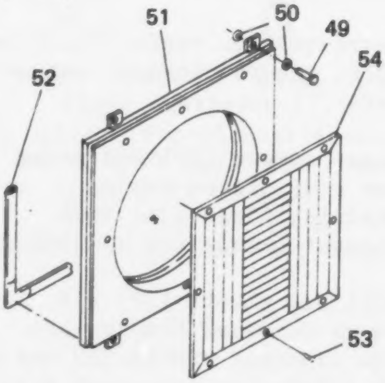
21. Remove weather seals (45) from closeout panels (35 and 36). (Refer to paragraph 4-41)
22. Drill out rivets (46) and remove retaining strips (47) from frame (48). (Refer to paragraph 4-33)



ECU Intake Panel

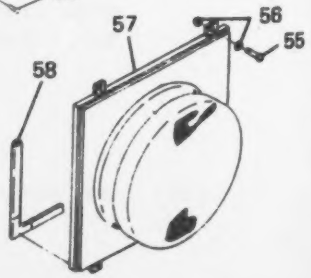
23. Punch out captive screw (49) and two washers (50) at each of four locations on ECU intake panel (51).
24. Remove weather seal (52) from ECU intake panel (51). (Refer to paragraph 4-41)
25. Drill out rivets (53) and remove vent cover grill (54) from ECU intake panel (51). (Refer to paragraph 4-33)





ECU Return Panel

26. Remove captive screw (55) and two washers (56) at each of four locations on ECU return panel (57).
27. Remove weather seal (58) from ECU return panel. (Refer to paragraph 4-41)



CLEANING, INSPECTION

1. Clean panel and component surfaces.
2. Inspect mounting surfaces for corrosion and damage.

4-22. (cont)

3. Inspect for and replace if necessary:

   a. Missing or damaged components

   b. Corrosion or paint damage.

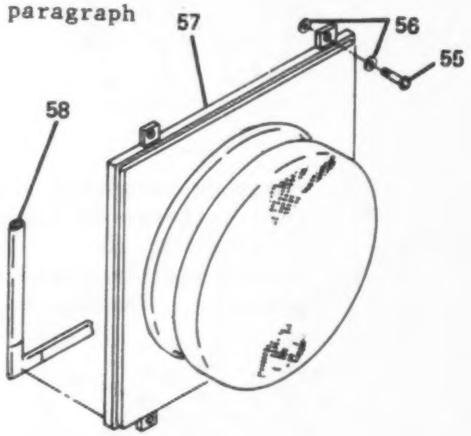
REPAIR

1. Panel skin damage. (Refer to Paragraphs 4-32 through 4-43)

2. Corrosion or paint damage. (Refer to paragraph 4-44)

ASSEMBLY

ECU Return Panel



1. Attach weather seal (58) to ECU return panel (57) with adhesive. (Refer to paragraph 4-41)

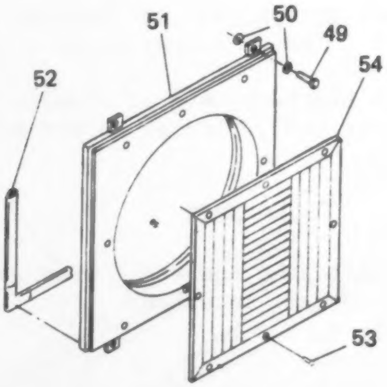
2. Using installation tool, assemble two washers (56) and captive screw (55) at each of four locations on ECU return panel (57).

ECU Intake Panel

3. Position vent cover grill (54) on ECU intake panel (51) and secure with rivets (53). (Refer to paragraph 4-33)

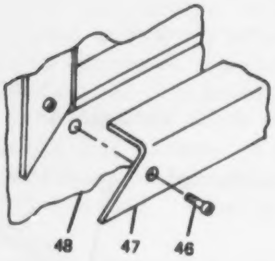
4. Attach weather seal (52) to ECU intake panel (51) with adhesive. (Refer to paragraph 4-41)

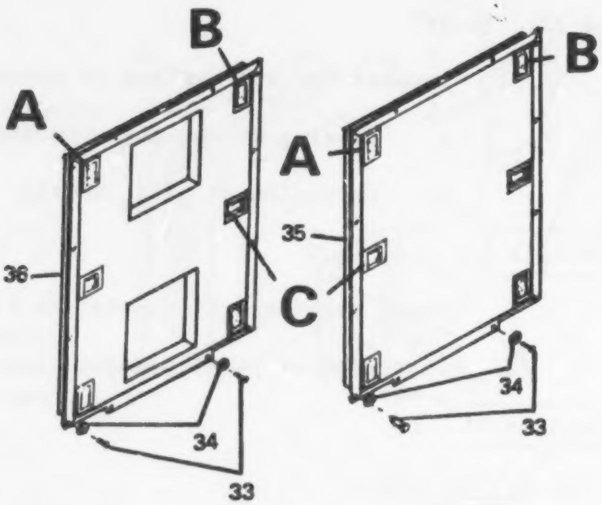
5. Using installation tool, assemble two washers (50) and captive screw (49) at each of four locations on ECU intake panel (51).



4-22. (cont)

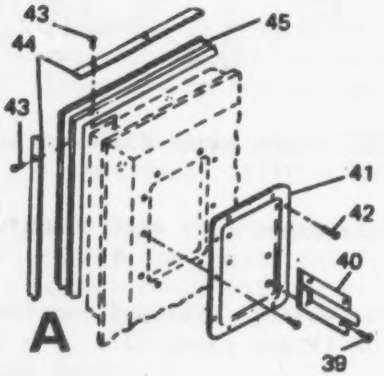
Sidewall Closeout Panels

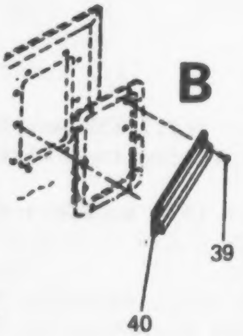


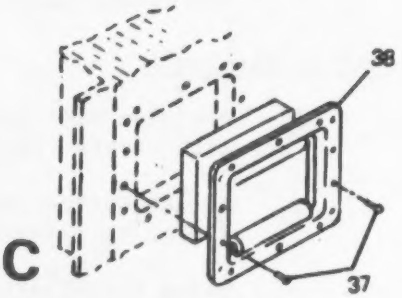


6. Position retaining strips (47) on frame (48) and secure with rivets (46). (Refer to paragraph 4-33)

7. Attach weather seals (45) to closeout panels (35 and 36) with adhesive. (Refer to paragraph 4-41)







8. Position retainer strips (44) on closeout panels (35 and 36) secure with rivets (46). (Refer to paragraph 4-33)

9. Position stowage brackets (40) on stowage bracket pans (41) and secure with rivets (40). (Refer to paragraph 4-33)

NOTE

There are left hand and right hand stowage brackets. Assemble in proper location.

10. Position stowage bracket pans (41) on closeout panels (35 and 36), bond with adhesive, and secure with rivets (42). (Refer to paragraph 4-33)

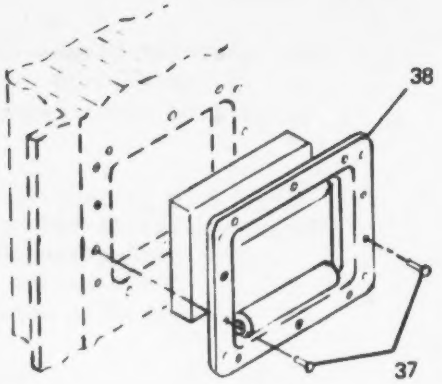
4-22. (cont)

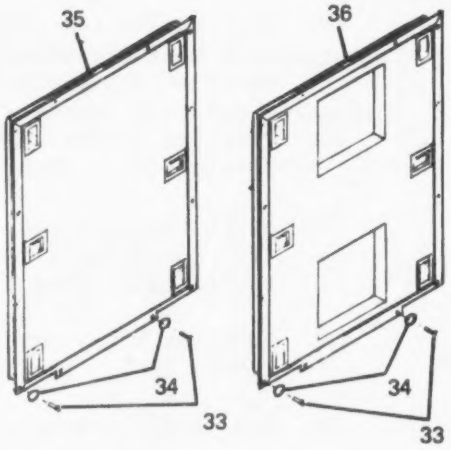
11. Position recessed handle (38) on closeout panels (35 and 36), bond with adhesive, and secure with rivets (37). (Refer to paragraph 4-33)

12. Using snap ring pliers, install retaining rings (34) and screws (33) in closeout panels (35 and 36).

13. Attach weather seals (31) to ECU intake and return closeout panels (32). (Refer to paragraph 4-41)

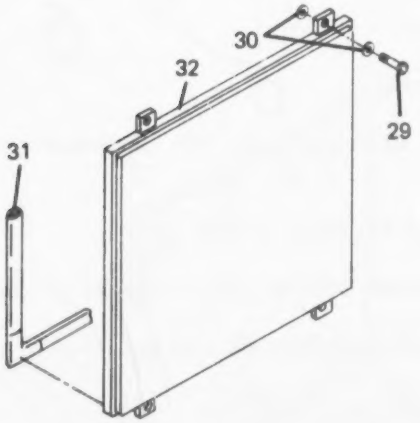
14. Using snap ring pliers, assemble two washers (30) and captive screw (29) at each of four locations on ECU intake and return closeout panels (32).

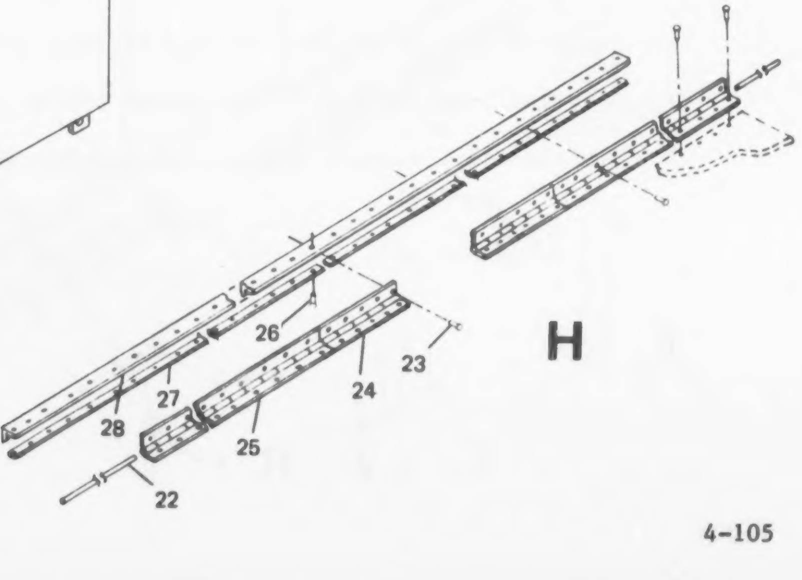




Hinged Sidewall

15. Assemble retainer strip (27) and seal (28) and secure with rivets (26). (Refer to paragraph 4-41)



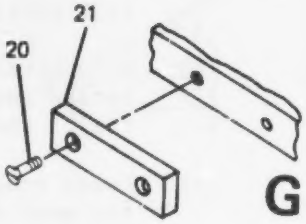


4-22. (cont)

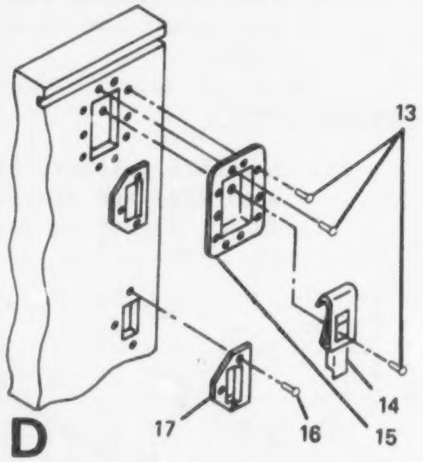
16. Assemble hinges (24 and 25) and secure with rivets (23). Refer to paragraph 4-33

NOTE

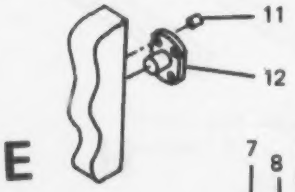
> The rivets on each end of the hinges are special high strength rivets and require the use of installation tool.

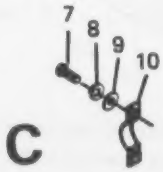


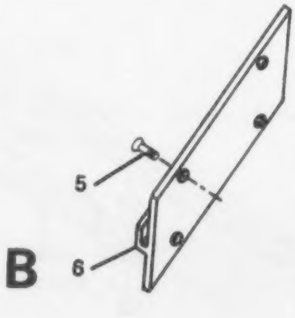
17. Insert three rivets at threshold. (Refer to paragraph 4-33)
18. Position spacer (21) and install screws (20).
19. Coat strike cup (17) and latch pan (15) mating surfaces and sidewall panel mounting areas with adhesive.
20. Position strike cup (17) and install rivets (16). (Refer to paragraph 4-33
21. Position latch pan (15) and latch (14) and install rivets (13). (Refer to paragraph 4-33)
22. Position brace cup (12) and install rivets (11). (Refer to paragraph 4-33
23. Coat strap brackets with sealant.

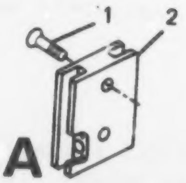


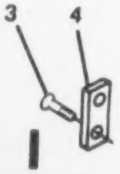
24. Position strap (10) and install with washers (9), lockwashers (8), and bolts (7).
25. Position stowage bracket (6) and install screws (5).
26. Position bumper pad (4) and install rivets (3). (Refer to paragraph 4-33)
27. Position jack support bracket (2) and install screws (1).











4-22. (cont)

INSTALLATION

1. Position replacement hinged sidewall on hinged floor with inside of sidewall down.

2. Install hinge pins (5) and (6), by first lubricating with spray lubricant, then driving it toward outside. Use a variable speed drill motor to drive the hinge pins all the way in the hinge.

3. Raise and lower sidewall to check for freedom of movement.

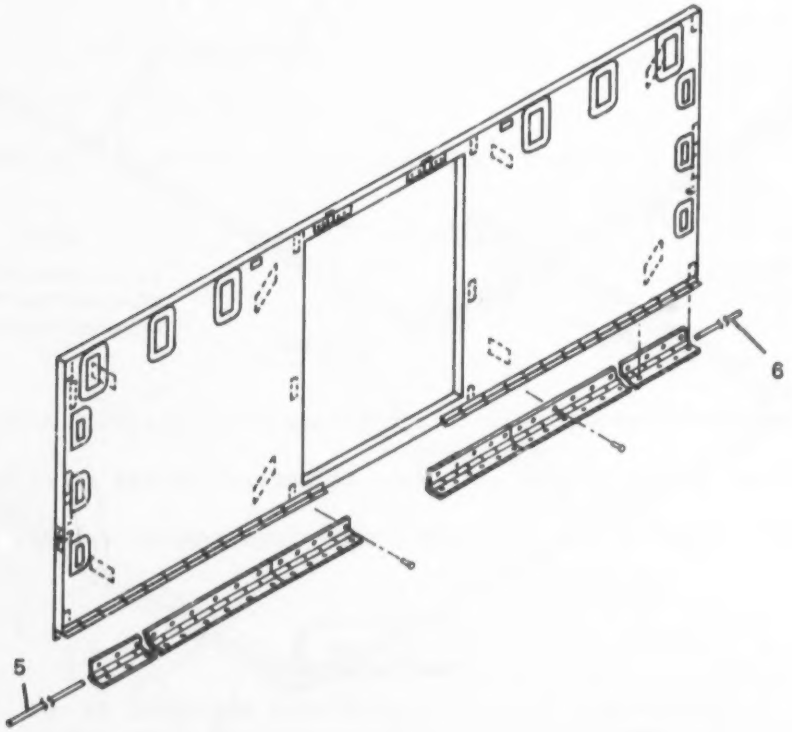
4. Raise hinged sidewall and hold in position.

5. Install two braces in brace cups on hinged floor and endwall.

6. Complete extension of expandable side by performing steps n through ae of paragraph 2-12.

7. Install three hinged roof area ceiling lights. (Refer to paragraph 3-5)

8. Move receptacle assemblies from temporary stowed position and mount on hinged sidewall.



4-23. HINGED FLOOR PANEL REPLACEMENT AND REPAIR

This task covers:

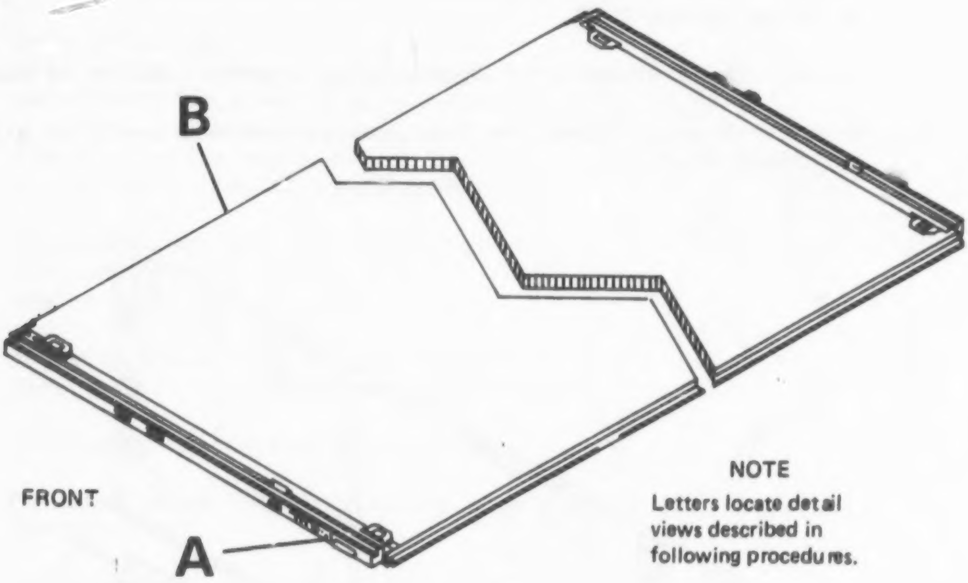
- a. Removal
- b. Disassembly
- c. Cleaning, Inspection
- d. Repair
- e. Assembly
- f. Installation

INITIAL SETUP

Special tools
  Hand blind riveter, Appendix B, Item 2
Standard Tools
  General mechanics tool kit
Personnel - 4
  1 Electrican

Materials
  Adhesive, Item 3, Appendix E
  Sealing Compound, Item 19, Appendix E

REMOVAL



NOTE
Letters locate detail views described in following procedures.

1. Remove hinged sidewall in accordance with paragraph 4-22.
2. Close stop plates on both load balancers mounted on fixed roof.
3. Lift hinged floor to remove weight from support cables.

WARNING

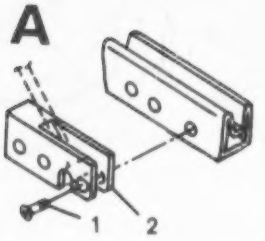
When hinged floor is in deployed position, do not disconnect support cable from hinged floor until stop plates on load balancer (inside shelter) have been locked with quick release pins to prevent return of support cable.

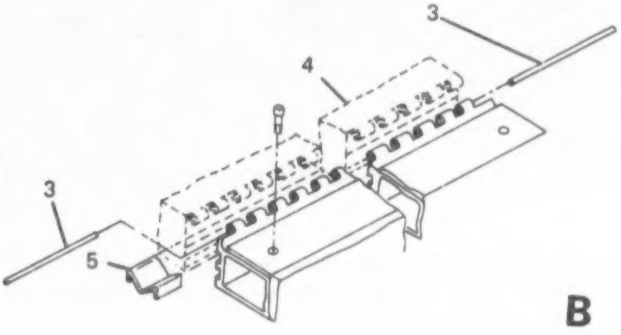
4-23. (cont)

4. Remove screws (1) from two cable guide brackets (2) and disengage support cables.

NOTE

Hinged floor needs to be in stowed position to remove seal and hinged sidewall removed (4-22) to remove hinge.



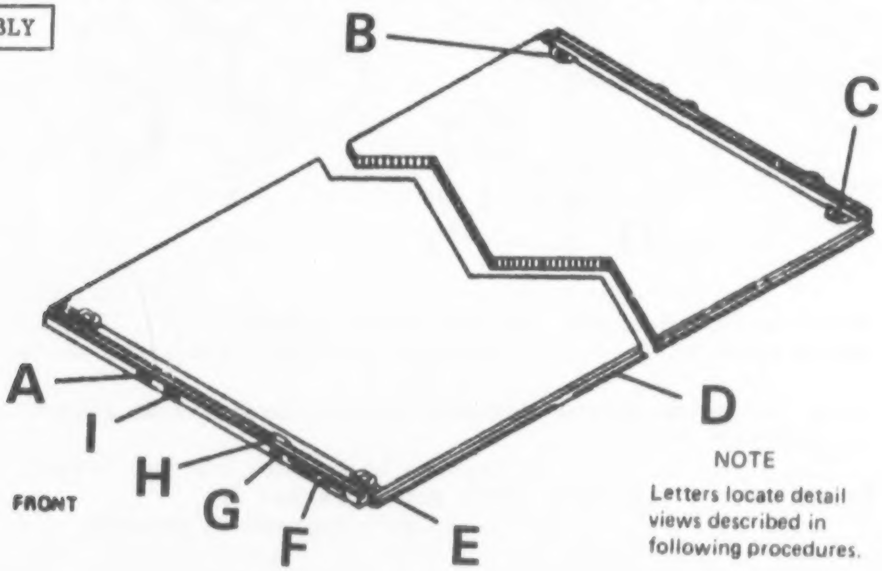


5. Peel off seal (5).

6. Remove two hinge pins (3).

7. Disengage hinged floor from fixed floor hinge (4).

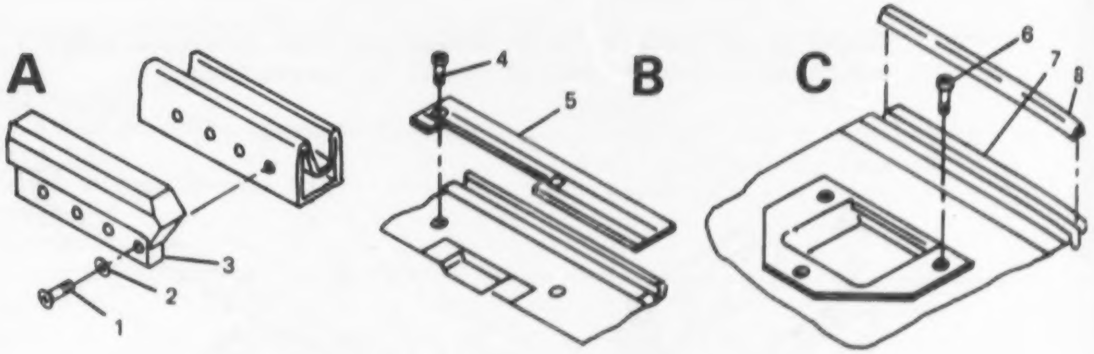
DISASSEMBLY



NOTE
Letters locate detail views described in following procedures.

4-23. (cont)

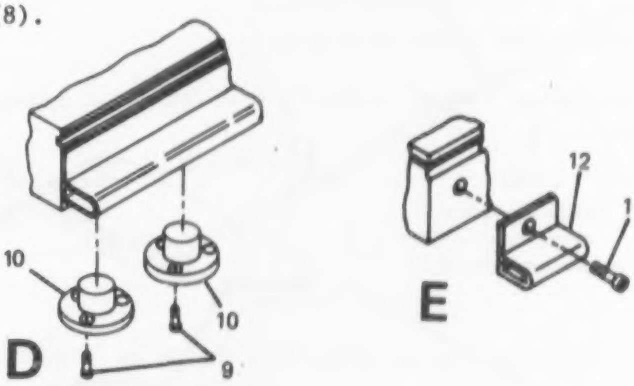
1. Remove screws (1) and washers (2)and remove cam strike (3).



2. Drill out blind rivets (4) and remove threshold (5). (Refer to paragraph 4-33

3. Drill out blind rivets (6) and remove strike cup (7). (Refer to paragraph 4-33

4. Peel off seal (8).

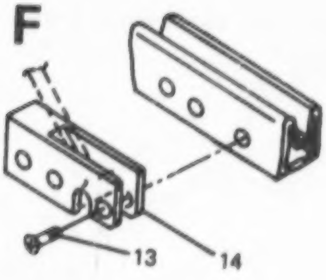


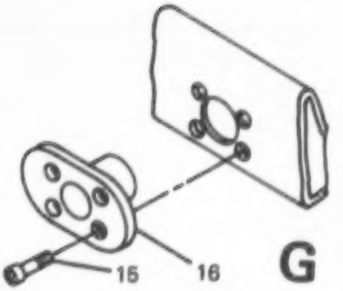
5. Drill out blind rivets (9) and remove grommets (10). (Refer to paragraph 4-33)

6. Drill out blind rivets (11) and remove closeout seal (12). (Refer to paragraph 4-33)

7. Remove screws (13) from cable guide bracket (14).

4-23. (cont)

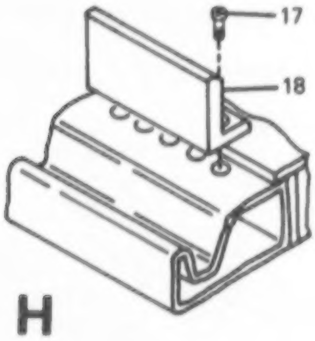


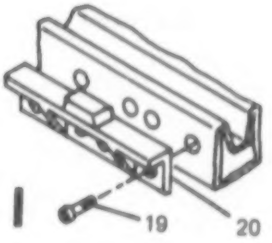


8. Drill out blind rivets (15) and remove brace cup (16). (Refer to paragraph 4-33)

9. Drill out blind rivets (17) and remove stop angle (18). (Refer to paragraph 4-33)

10. Drill out blind rivets (19) and remove shear plate (20). (Refer to paragraph 4-33)





CLEANING, INSPECTION

1. Clean panel and component surfaces.

2. Inspect mounting surfaces for corrosion and damage.

3. Inspect for and replace if necessary:

    a. Missing or damaged components

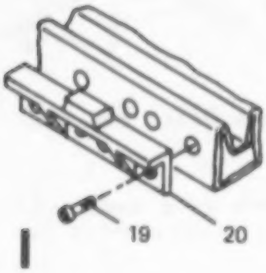
    b. Corrosion or paint damage.

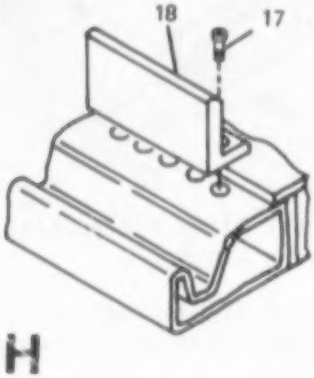
4-23. (cont)

REPAIR

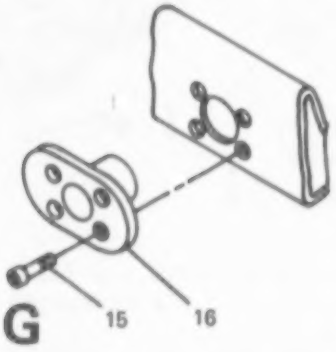
1. Panel skin damage. (Refer to paragraphs 4-32 through 4-43)
2. Corrosion or paint damage. (Refer to paragraph 4-44)

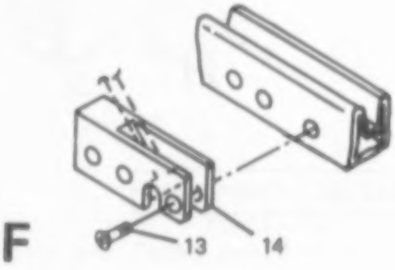
ASSEMBLY





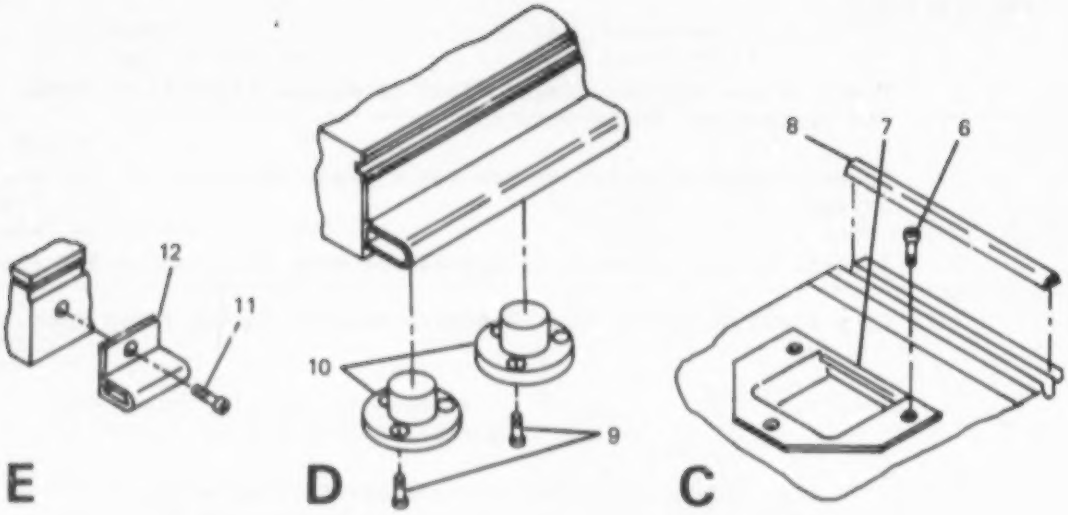
1. Position shear plate (20) and install rivets (19). (Refer to paragraph 4-33)
2. Position stop angle (18) and install rivets (17). (Refer to paragraph 4-33)
3. Position brace cup (16) and install rivets (15). (Refer to paragraph 4-33)
4. Position bracket (14) and install screws (13).





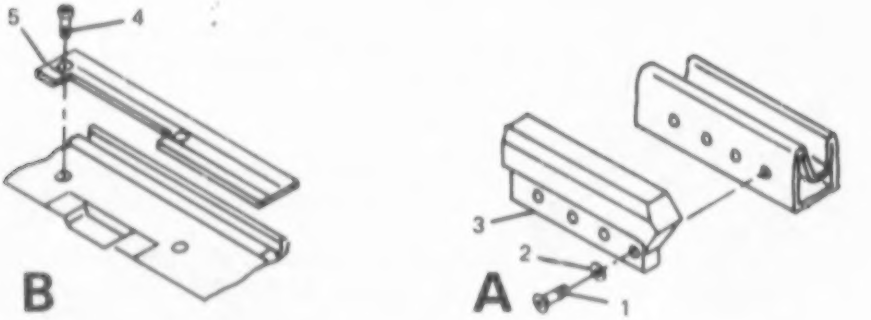
5. Position closeout seal (12) and install rivets (11). (Refer to paragraph 4-33)
6. Position grommets (10) and install rivets (9). (Refer to paragraph 4-33)

4-23. (cont)



7. Install seal (8) with adhesive. (Refer to paragraph 4-41)

8. Position strike cup (7) and install rivets (6). (Refer to paragraph 4-33)



9. Coat threshold (5) and mounting surface with sealant.

10. Position threshold (5) and install rivets (4). (Refer to paragraph 4-33)

11. Position cam strike (3) and install washers (2) and screws (1).

4-23. (cont)

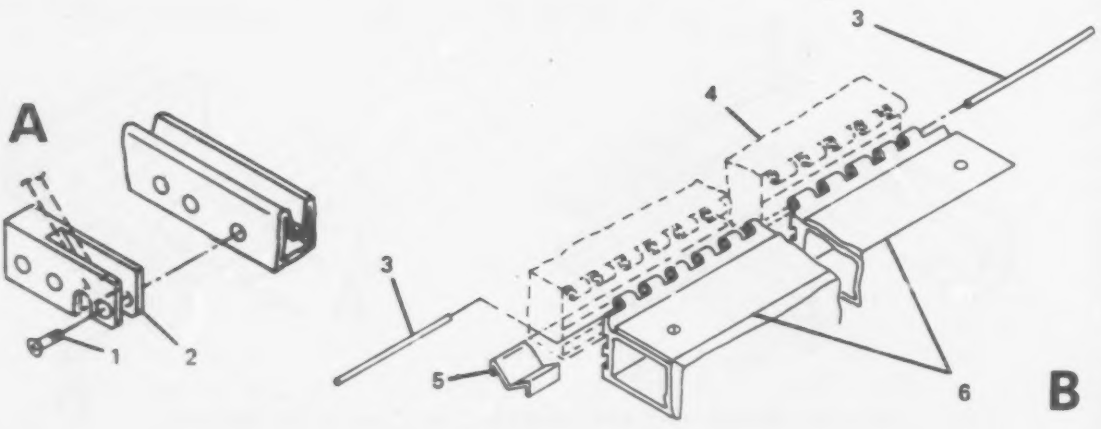
INSTALLATION

1. Position and support hinged floor to engage fixed floor hinge (4) and install two hinge pins (3).
2. Connect support cables to two cable guide brackets (2) and install screws (1).
3. Install hinged sidewall in accordance with paragraph 4-22.
4. Open stops on cable load balancers mounted inside fixed roof.

NOTE

Seal (5) is installed after floor is completely installed with shelter in closed configuration.

5. Install seal (5) between fixed floor (4) and hinged floor (6).



4-24. CONTAINER LIFT JACK ASSEMBLY SERVICE AND REPAIR

This task covers:

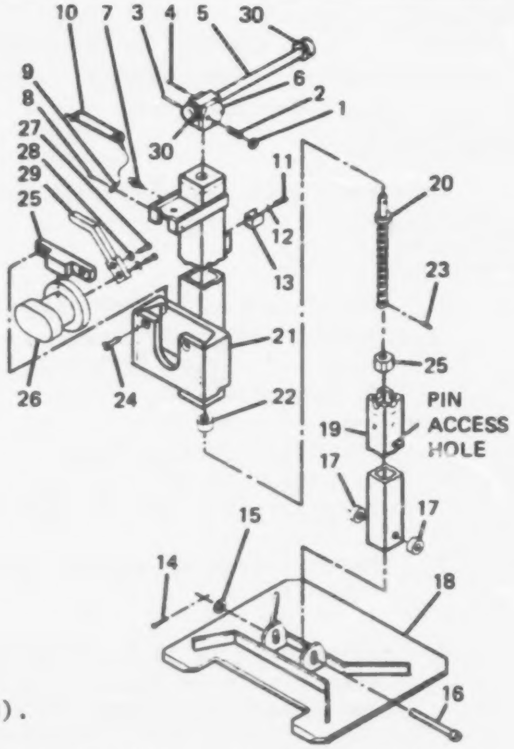
- a. Disassembly
- b. Cleaning, Inspection
- c. Repair
- d. Lubrication
- e. Assembly

INITIAL SETUP

Standard tools
General mechanics tool kit
Grease gun

Materials
Grease, Item 12, Appendix E

DISASSEMBLY



1. Remove nut (1), spring plunger (2), pin (3), and handle (4).

2. Remove pin (4) and separate handle (5) from support (6). Remove two O-rings (30) from handle (5).

3. Remove grease fitting (7).

4. Remove rivet (8) to remove lanyard (9) and safety pin (10).

NOTE

Do not remove lanyard unless pins or cables are damaged.

5. Remove screws (11), lockwashers (12), and spring tension clip (13).

6. Remove cotter pin (14), washer (15), pin (16), and spacers (17) to remove base (18) from basic jack.

7. Remove inside tube (19) and jack screw (20) from outside tube (21).

8. Remove bearing (22).

9. Drive pin (23) out through access hole and remove jack screw (20) from inside tube (19).

10. Remove screws (24), retainer (25), and rotating insert (26).

11. Remove screws (27), lockwashers (28), and handle (29). Remove O-rings (30).

4-24. (cont)

CLEANING, INSPECTION

1. Clean jack assembly and component surfaces.

2. Inspect mounting surfaces for corrosion and damage.

3. Inspect for and replace if necessary:

   a. Missing or damaged components

   b. Corrosion or paint damage.

REPAIR

Corrosion or paint damage. (Refer to paragraph 4-44)

LUBRICATION

Lubricate jack assembly with grease.

ASSEMBLY

1. Position handle (29) on rotating insert (26) and install lockwashers (28) and screws (27). Install O-rings (30).

2. Position rotating insert (26) in outside tube (21) and secure retainer (25) with screws (24).

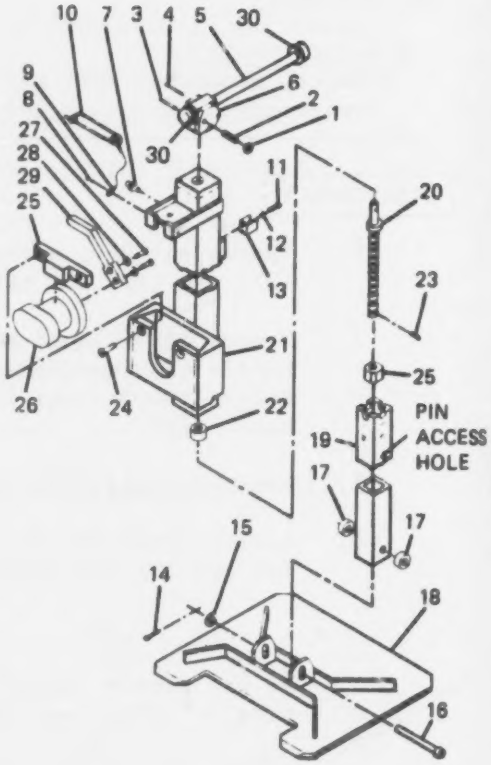
3. Install jack screw (20) in inside tube (19).

4. Align hole in jack screw (20) with access hole in inside tube (19) and install pin (23).

5. Pack bearing (22) with grease and place on jack screw (20).

6. Install inside tube (19) in outside tube (21).

7. Position handle (5) in support (6) and on jack screw (19) with holes in handle yoke and jack screw aligned. Install pins (3 and 4).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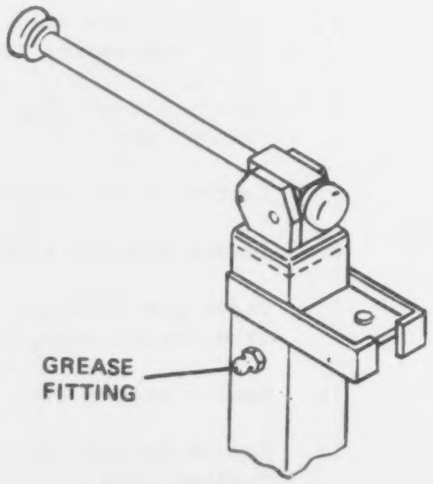

GREASE
FITTING

4-24. (cont)

8. Install spring plunger (2) in handle yoke and secure with nut (1). Adjust nut to control handle movement.

9. Position basic jack on base (18) with spacers (17) and secure with pin (16), washer (15), and new cotter pin (14).

10. Install grease fitting (7) and lubricate jack with grease.

4-25. PERSONNEL DOOR END ENDWALL PANEL REPLACEMENT AND REPAIR

This task covers:

a. Removal	d. Repair
b. Disassembly	e. Assembly
c. Cleaning, Inspection	f. Installation

INITIAL SETUP

Special Tools	Materials
Hand blind riveter, Appendix B, Item 2	Adhesive, Item 2, Appendix E
Personnel - 4	Standard tools
1 Electrician	General emchanics tool kit

REMOVAL

Personnel Door End Endwall Panel

1. Set main circuit breaker to OFF position.

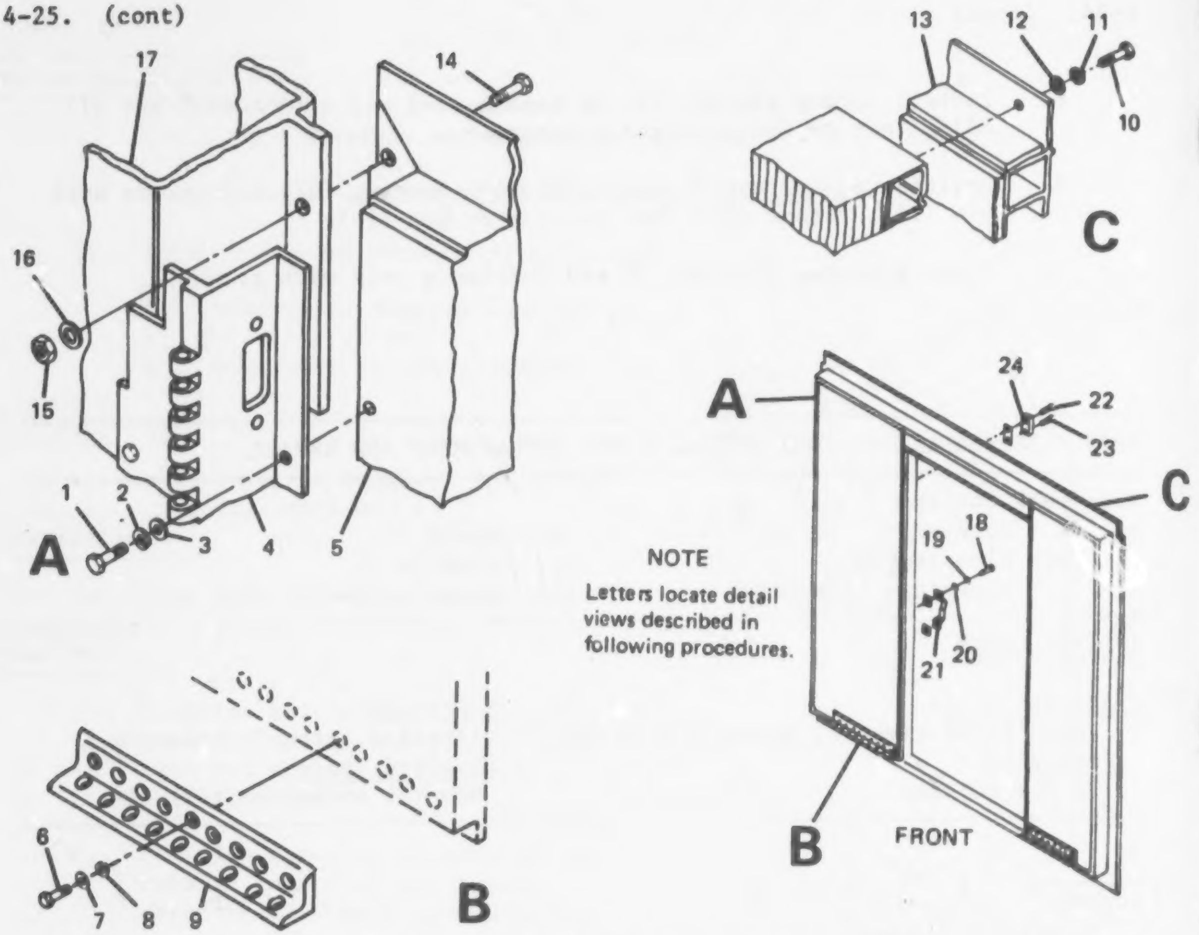
2. Disconnect service entry power at power entry panel and remove components. (Refer to paragraph 5-3)

3. Remove door activated blackout switch and associated wiring. (Refer to paragraph 4-15)

4. Remove area light assembly. (Refer to paragraph 3-4)

5. Remove hinged endwalls adjacent to personnel door end panel endwall in accordance with paragraph 4-21.

4-25. (cont)



NOTE
Letters locate detail views described in following procedures.

6. Remove screws (1), lockwashers (2), and washers (3) securing hinged endwall hinge (4) to fixed endwall (5) and corner post.

7. Remove screws (6), lockwashers (7), and washers (8) securing reinforcement angles (9) to fixed endwall.

8. Remove bolts (10), lockwashers (11) and washers (12) securing fixed endwall (13) to fixed roof and floor.

9. Remove bolts (14), nuts (15) and washers (16) securing fixed endwall (5) to corner posts (17).

10. Remove screws (18), lockwashers (19), and washers (20) and remove ice break (21).

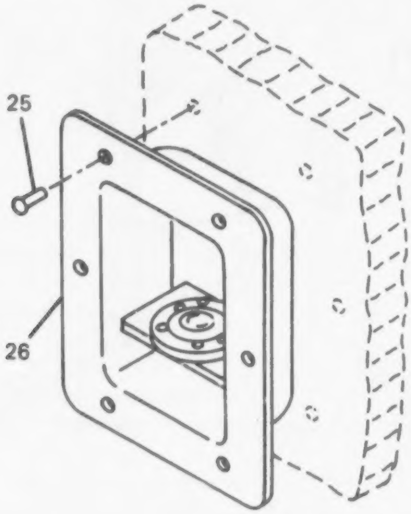
11. Remove screws (22 and 23) and remove keepers (24).

4-25. (cont)

12. Support fixed endwall and remove by using a putty knife (or similar tool) to break bond between endwall and fixed roof, fixed floor, and corner posts.

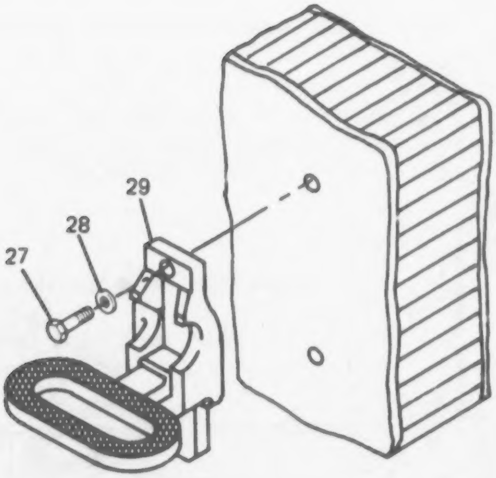
Level Assembly

13. Drill out six rivets (25) and remove each of two level assemblies (26). (Refer to paragraph 4-33)



Folding Step

14. Remove two screws (27) and lockwashers (28) and remove each of five folding steps (29).

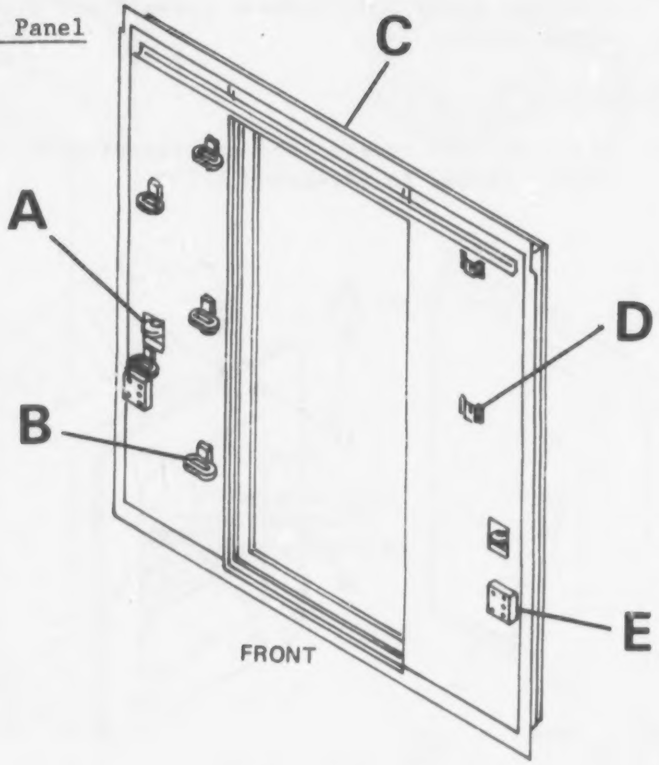


4-25. (cont)

DISASSEMBLY

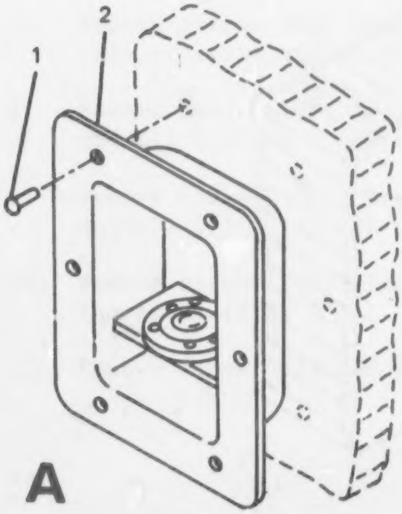
Personnel Door End Endwall Panel

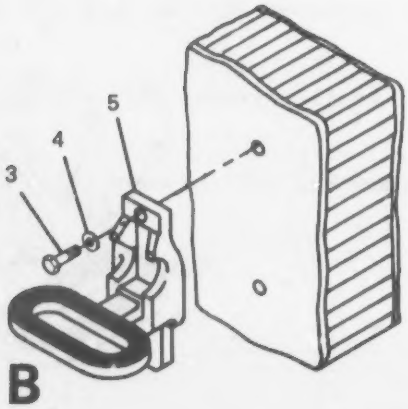
NOTE
Letters locate detail views described in following procedures.



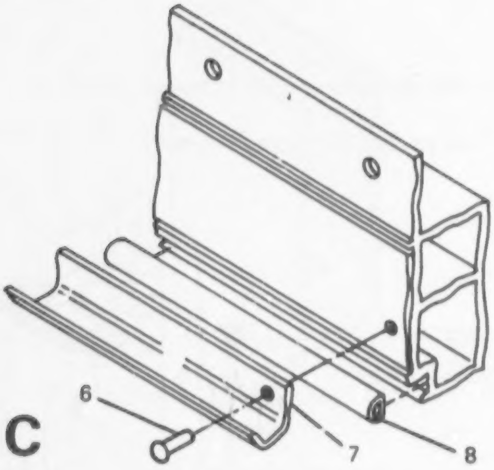
1. Drill out rivets (1) and remove level (2). (Refer to paragraph 4-33)

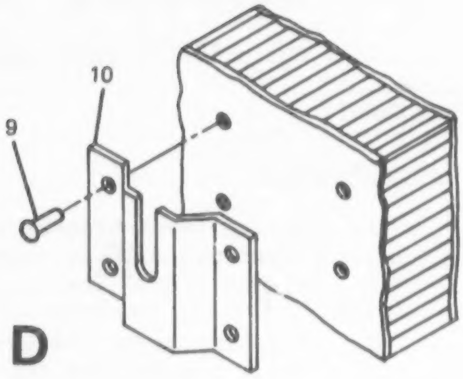
2. Remove screws (3) and lockwashers (4) and remove folding step (5).





4-25. (cont)

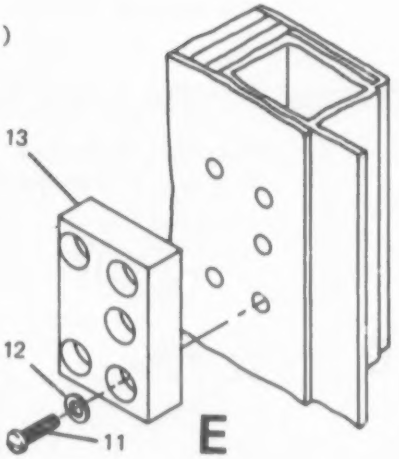




3. Drill out rivets (6) and remove drip strip (7). (Refer to paragraph 4-33)

4. Strip seal (8) away from door opening.

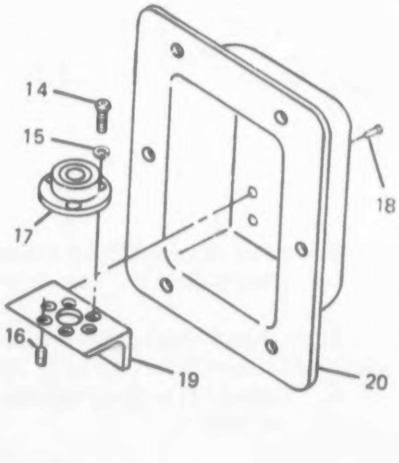
5. Drill out rivets (9) and remove light bracket (10). (Refer to paragraph 4-33)
6. Remove screws (11) and lockwashers (12) and remove upper mobilizer fitting (13).



Level Assembly

7. Remove screws (14), lockwashers (15), and setscrews (16) and remove level indicator (17) from level bracket (19).

8. Drill out rivets (18) and remove level bracket (19) from level pan (20). (Refer to paragraph 4-33)



CLEANING, INSPECTION

1. Clean panel and component surfaces.

2. Inspect mounting surfaces for corrosion and damage.

3. Inspect for and replace if necessary:

   a. Missing or damaged components

   b. Corrosion or paint damage.

4-25. (cont)

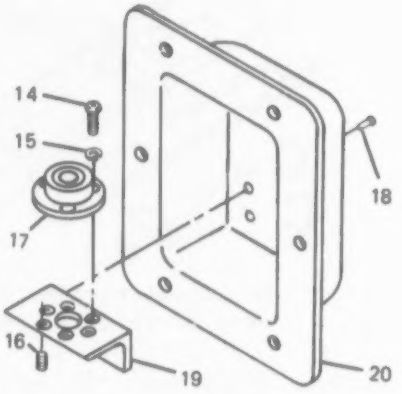
REPAIR

1. Panel skin damage. (Refer to paragraphs 4-32 through 4-43)

2. Corrosion or paint damage. (Refer to paragraph 4-44)

ASSEMBLY

Level Assembly

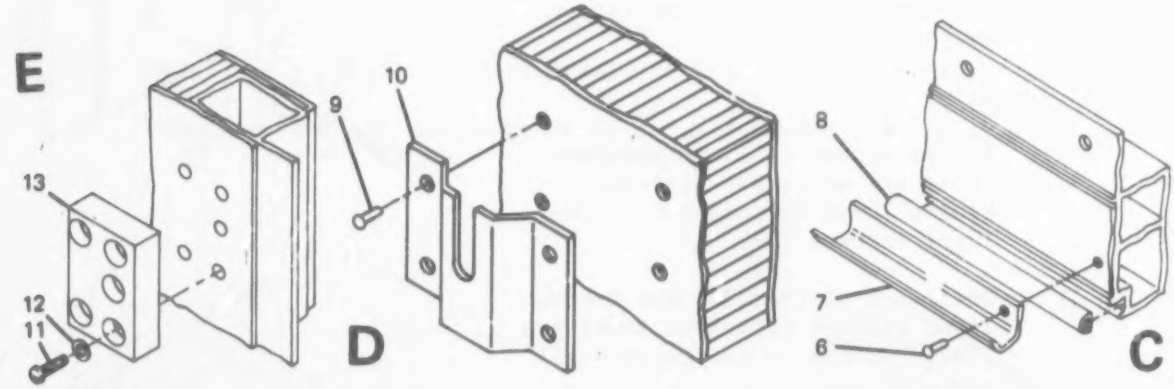


1. Secure level bracket (19) to level pan (20) by installing rivets (18). (Refer to paragraph 4-33)

2. Position level indicator (17) on level bracket and install setscrews (16), lockwashers (15), and screws (14).

Personnel Door End Endwall Panel

3. Position mobilizer fitting (13) and install lockwashers (12) and screws (11).

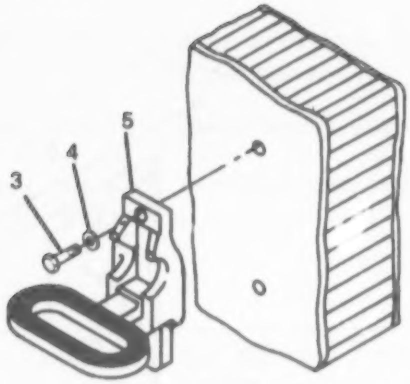


4. Position light bracket (10) and install rivets (9). (Refer to 4-33)

5. Bond seal (8) in place with adhesive. (Refer to paragraph 4-41)

6. Position drip strip (7) and install rivets (6). (Refer to paragraph 4-33)

4-25. (cont)



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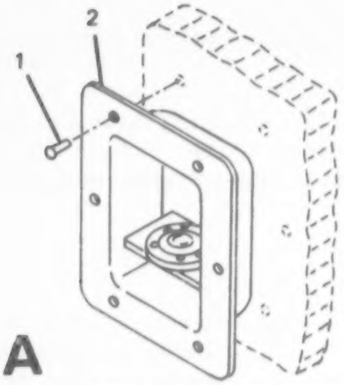


A

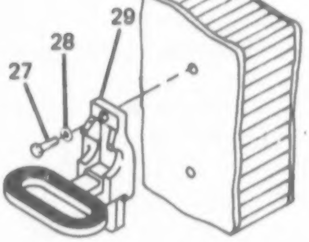
7. Position folding step (5) and install lockwashers (4) and screws (3).

8. Position level (2) and install rivets (1). (Refer to paragraph 4-33)

INSTALLATION

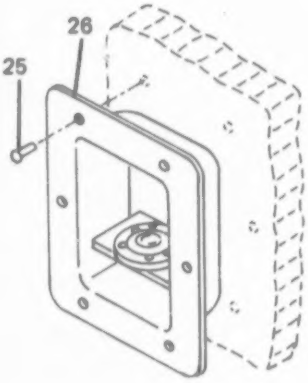
Folding Step

1. Position each of five folding steps (29) against panel and install two lockwashers (28) and screws (27).



Level Assembly

2. Secure each of two level assemblies (26) by installing six rivets (25). (Refer to paragraph 4-33)



NOTE

Level assemblies must be calibrated after assembly of shelter is complete. Use a four foot level or other suitable tool and adjust three setscrews on level to calibrate.

Personnel Door End Endwall Panel

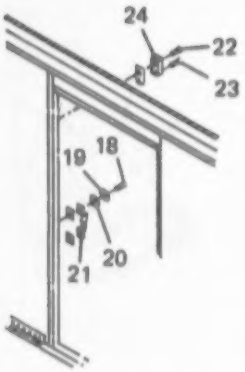
3. From outside shelter, position fixed endwall on fixed floor and push inward until endwall is against corner posts mating surfaces.

4. Align fixed endwall mounting holes with mounting holes and inserts in corner posts, fixed roof, reinforcement angles, and endwall hinge.

4-25. (cont)

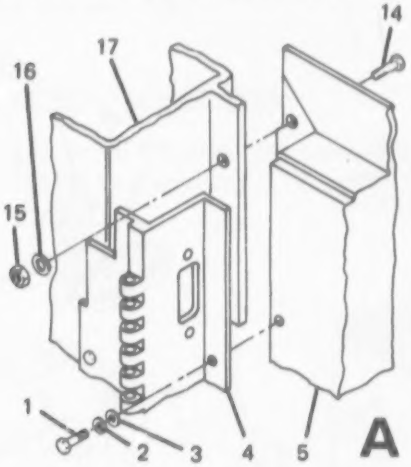
NOTE

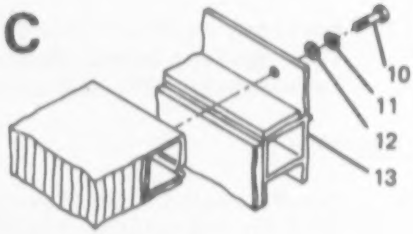
Align mounting holes at fixed endwall corners and insert bolts. Check that remaining holes and inserts are aligned and free from obstructions.



5. Install screws (22 and 23) securing keepers (24) to fixed endwall (5).

6. Install screws (18), lockwashers (19), and washers (20) securing ice break (21) to fixed endwall (5).





7. Install bolts (14), washers (16), and nuts (15) securing fixed endwall (5) to corner posts (17).

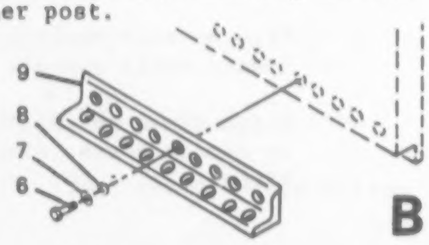
8. Install washers (12), lockwashers (11), and bolts (10) securing fixed endwall (13) to fixed roof and floor.

9. Install washers (8), lockwashers (7), and screws (6) securing reinforcement angles (9) to fixed endwall.

10. Install washers (3), lockwashers (2) and screws (1) securing endwall hinge (4) to fixed endwall (5) and corner post.

11. Install hinged endwalls in accordance with paragraph 4-21.

12. Install area light assembly. (Refer to paragraph 3-4)



4-25. (cont)

13. Install door activated blackout switch and associated wiring. (Refer to paragraph 4-15)

14. Install power entry panel. (Refer to paragraph 5-3)

15. Connect services entry power and set main circuit breaker to ON position.

4-26. CARGO DOOR END ENDWALL PANEL REPLACEMENT AND REPAIR

This task covers:

- a. Removal
- b. Disassembly
- c. Cleaning, Inspection
- d. Repair
- e. Assembly
- f. Installation

INITIAL SETUP

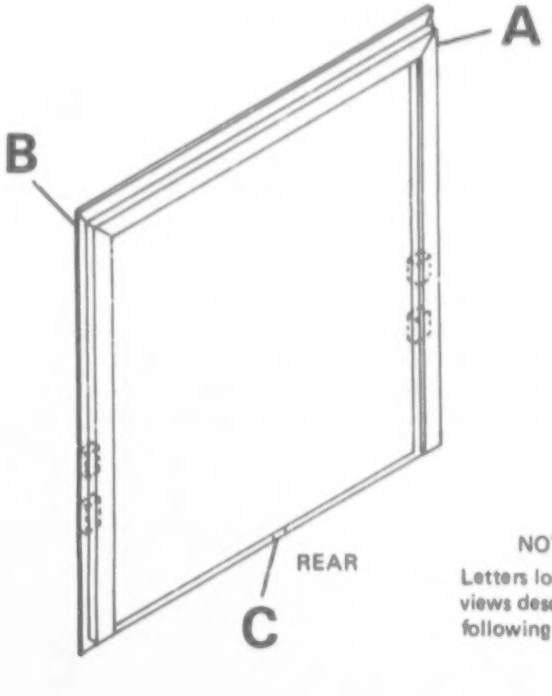
Special Tools
Hand blind riveter, Appendix B, Item 2

Standard Tools
General mechanics tool kit

Materials
Adhesive, Item 2, Appendix E

Personnel - 4

REMOVAL



NOTE
Letters locate detail views described in following procedures.

4-26. (cont)

1. Remove cargo doors in accordance with paragraphs 4-17 and 4-18.

2. Remove hinged endwalls adjacent fixed cargo endwall in accordance with paragraph 4-21.

3. Remove screws (1), lockwashers (2), and washers (3) securing hinged endwall hinge (4) to fixed endwall and corner post.

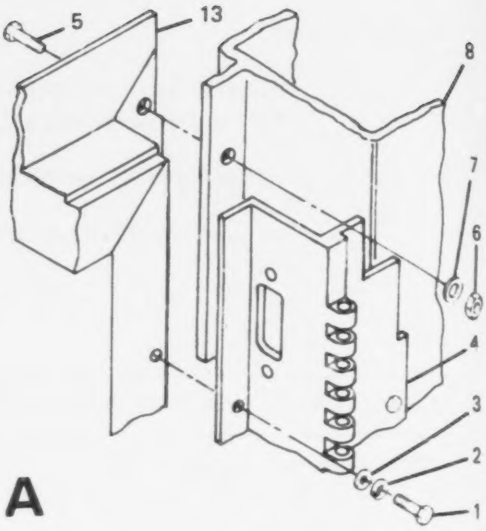
4. Remove bolts (5), nuts (6) and washers (7) securing fixed endwall (13) to corner posts (8).

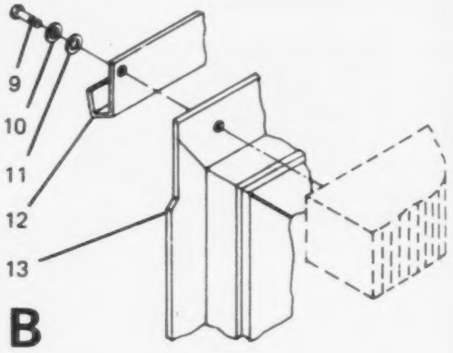
5. Remove bolts (9), lockwashers (10), and washers (11) securing drip cap (12) and fixed endwall (13) to fixed roof.

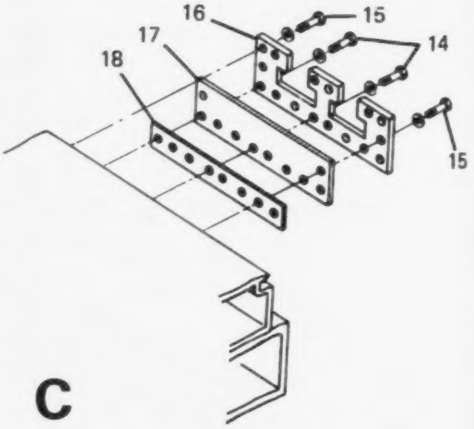
6. Remove eight screws (14), eight screws (15), shear plate (16) and shims (17 and 18).

7. Remove bolts (9), lockwashers (10), and washers (11) securing fixed endwall (13) to fixed floor.

8. Support fixed endwall, cut through adhesive sealant, and remove by using a putty knife (or similar tool) to break bond between endwall and fixed roof, fixed floor, and corner posts.

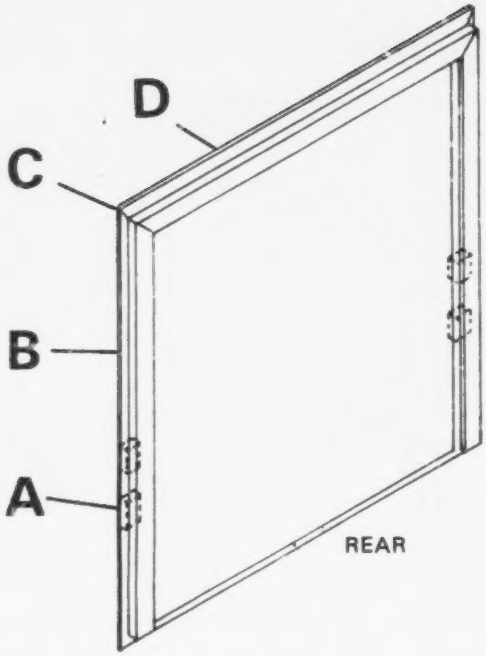






4-26. (cont)

DISASSEMBLY

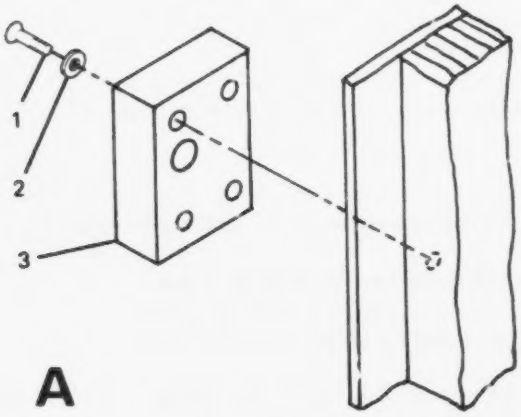


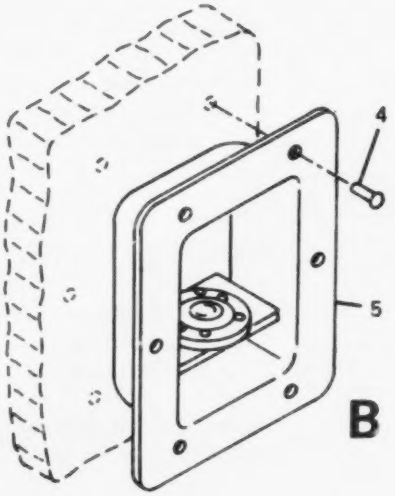
NOTE

Letters locate detail views described in following procedures.

1. Remove screws (1) and lockwashers (2) and remove upper mobilizer fittings (3).

2. Drill out rivets (4) and remove level pan (5). (Refer to paragraph 4-33)



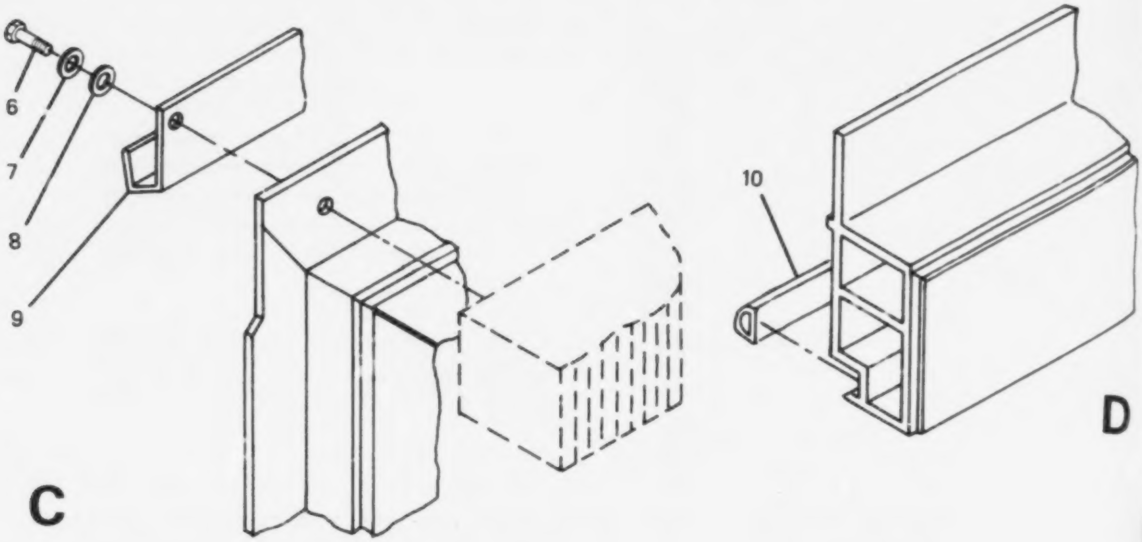


best copy available

4-26. (cont)

4. Remove bolts (6), lockwashers (7), drip cap (8), and washers (9).

5. Strip seal (10) away from opening.



CLEANING, INSPECTION

1. Clean panel and component surfaces.

2. Inspect mounting surfaces for corrosion and damage.

3. Inspect for and replace if necessary:

   a. Missing or damaged components

   b. Corrosion or paint damage.

REPAIR

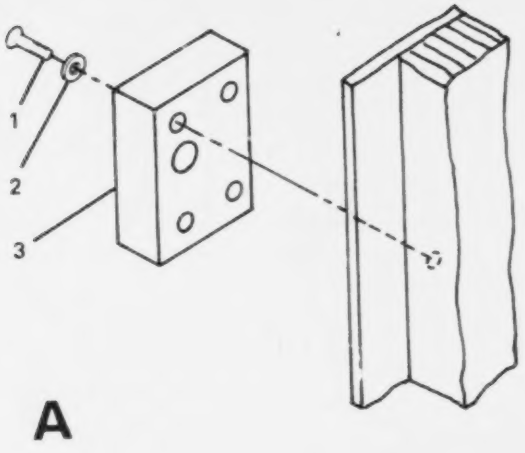
1. Panel skin damage. (Refer to paragraphs 4-32 through 4-43)

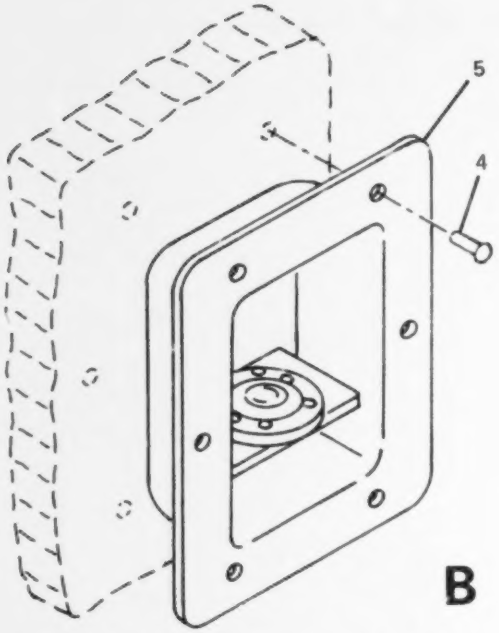
2. Corrosion or paint damage. (Refer to paragraph 4-44)

ASSEMBLY

1. When assembling endwall panel to roof, position drip cap (8) and install washers (9), lockwashers (7) and bolts (6).

4-26. (cont)





2. Position upper mobilizer fitting (3) and install lockwashers (2) and screws (1).

3. Position level (5) and install rivets (4). (Refer to paragraph 4-33)

4. Bond seal (10) in place with adhesive. (Refer to paragraph 4-41)

INSTALLATION

1. Apply adhesive before positioning endwall panel.

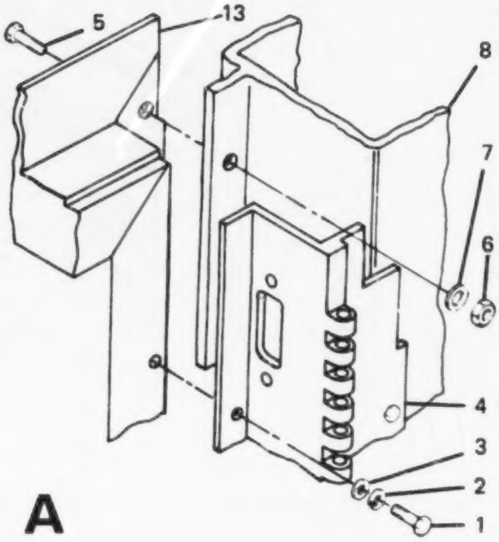
2. From outside shelter, position fixed endwall on fixed floor and push inward until endwall is against corner posts mating surfaces.

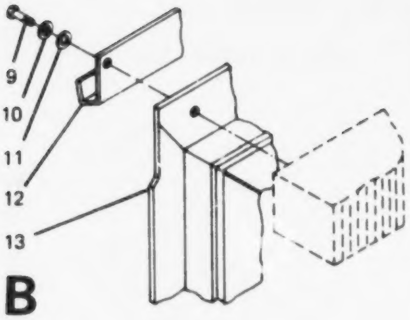
3. Align fixed endwall mounting holes with mounting holes and inserts in corner posts, fixed roof, fixed floor, and endwall hinge.

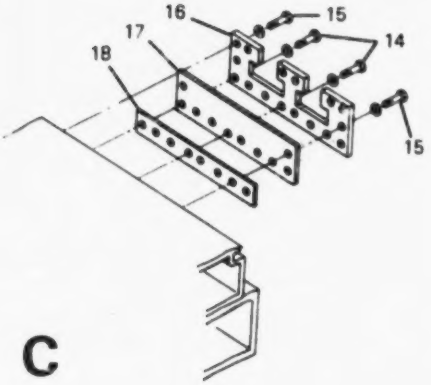
NOTE

Align mounting holes at fixed endwall corners and install bolts. Check that remaining holes and inserts are aligned and free from obstructions.

4-26. (cont)







4. Install bolts (5), washers (7), and nuts (6) securing fixed endwall to corner posts (8).

5. Install washers (11), drip cap (12), lockwashers (10), and bolts (9) securing fixed endwall (13) to fixed roof.

6. Install washers (11), lockwashers (10), and bolts (9) securing fixed endwall (13) to fixed floor.

7. Install washers (3), lockwashers (2), and screws (1) securing hinged endwall hinge (4) to fixed endwall (13) and corner post.

8. Position shims (17 and 18) and shear plate (16) against endwall panel and floor and secure with eight screws (15) and eight screws (14).

9. Install cargo doors in accordance with paragraphs 4-17 and 4-18.

10. Install hinged endwalls in accordance with paragraph 4-21.

11. Calibrate level after shelter is assembled using four-foot level and three setscrews to properly calibrate.

4-27. SIDEWALL PANEL REPLACEMENT AND REPAIR

This task covers:

a. Removal	d. Repair
b. Disassembly	e. Assembly
c. Cleaning, Inspection	f. Installation

INITIAL SETUP

Special Tools
Hand blind riveter, Appendix B, Item 2
Installation tool, Appendix B, Item 3

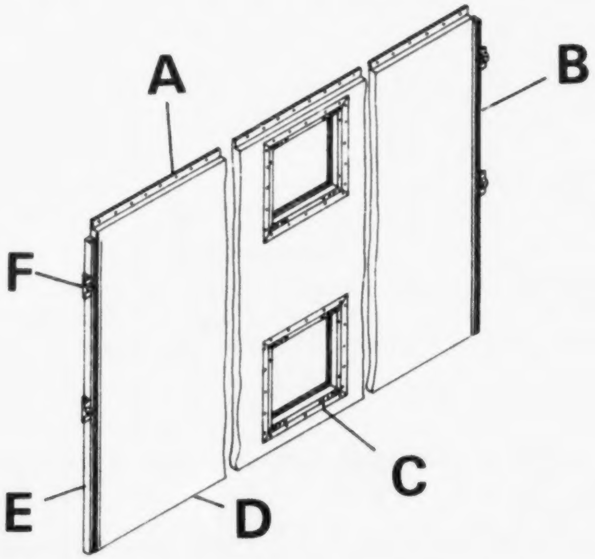
Standard Tools
General mechanics tool kit

Personnel - 4
1 Electrician

Equipment Condition
ECU panels removed from sidewall panel

Materials
Adhesive, Item 3, Appendix E
Sealing Compound, Item 19, Appendix E
Solvent, Item 20, Appendix E

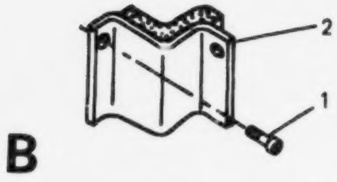
REMOVAL

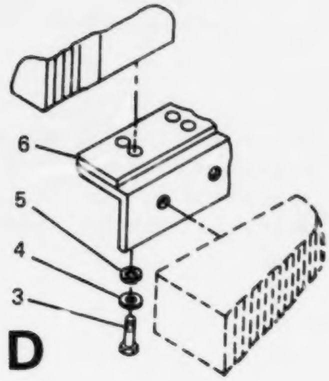


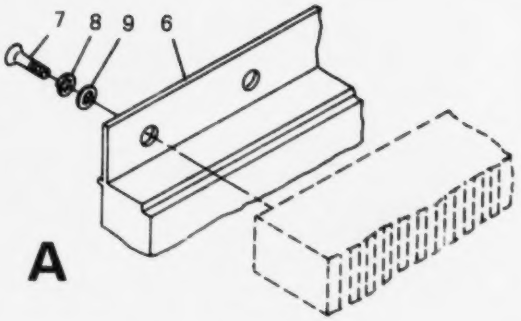
1. Disconnect ECU, if being used, and remove ECU or closeout panels.

4-27. (cont)

2. Remove screws (1) securing two corner enclosures (2) to sidewall panel (6).







3. Remove bolts (3), lockwashers (4), and washers (5) securing sidewall panel (6) to fixed floor.

4. Remove bolts (7), lockwashers (8), and washers (9) securing sidewall panel (6) to fixed roof.

WARNING

Methylethylketone is flammable and toxic and shall be used in a well-ventilated area away from sparks or open flame. Gloves should be worn when used.

5. Apply solvent to sealed interface areas of sidewall panel and mating surfaces.

6. Block or support sidewall panel from outside shelter and use putty knife to break sealant.

7. Push from inside shelter and remove sidewall panel.

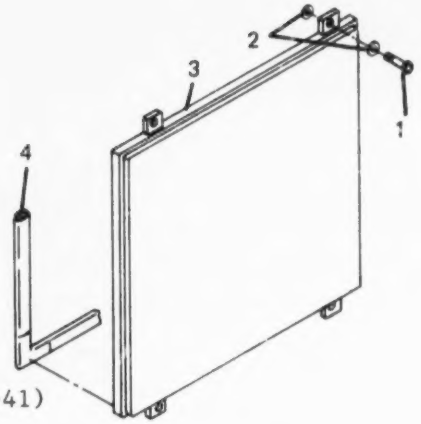
DISASSEMBLY

Sidewall Closeout Panel

1. Remove captive screw (1) and two washers (2) at each of four locations on ECU intake and return closeout panels (3).

4-27. (cont)

2. Remove weather seals (4) from ECU intake and return closeout panels (3). (Refer to paragraph 4-41)



ECU Intake Panel

3. Remove captive screw (5) and two washers (6) at each of four locations on ECU intake panel (7).

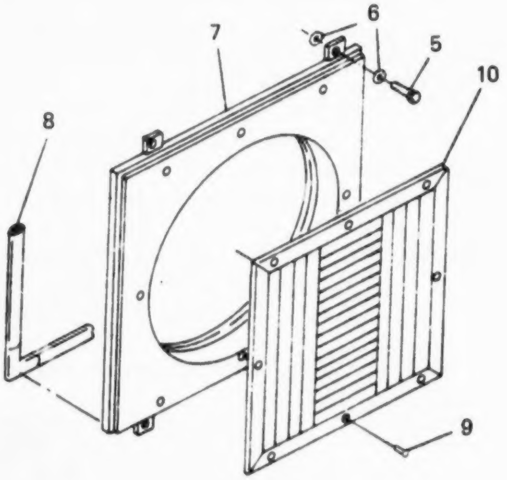
4. Remove weather seal (8) from ECU intake panel (7). (Refer to paragraph 4-41)

5. Drill out rivets (9) and remove vent cover grill (10) from ECU intake panel (7). Refer to paragraph 4-33)

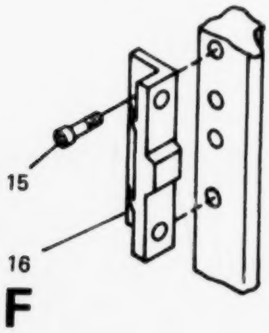
ECU Return Panel

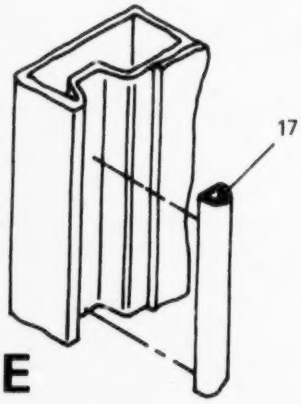
6. Remove captive screw (11) and two washers (12) at each of four locations on ECU return panel (13).

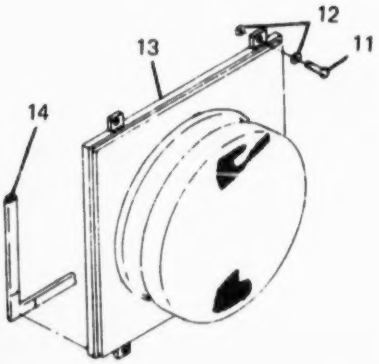
7. Remove weather seal (14) from ECU return panel (13). (Refer to paragraph 4-41)



Sidewall Panel

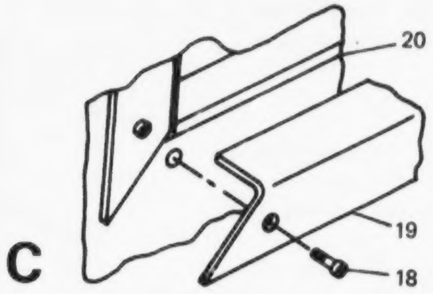






8. Drill out rivets (15) and remove shear plate (16). (Refer to paragraph 4-33)
9. Strip seal (17) from sidewall panel.

4-27. (cont)



10. Drill out rivets (18) to remove retaining strips (19) and frame (20). (Refer to paragraph 4-33)

CLEANING, INSPECTION

1. Clean sidewall panel and component surfaces.
2. Inspect mounting surfaces for corrosion and damage.
3. Inspect for and replace if necessary:
   a. Missing or damaged components
   b. Corrosion or paint damage.

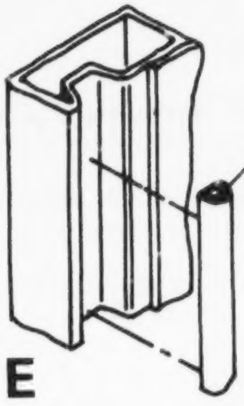
REPAIR

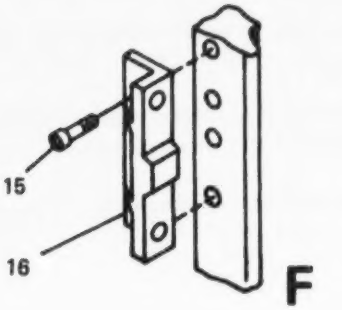
1. Panel skin damage (Refer to paragraphs 4-32 through 4-43)
2. Corrosion or paint damage. (Refer to paragraph 4-44)

ASSEMBLY

1. Position frame (20) and retaining strips (19) on sidewall panel and install rivets (18). (Refer to paragraph 4-33)

4-27. (cont)





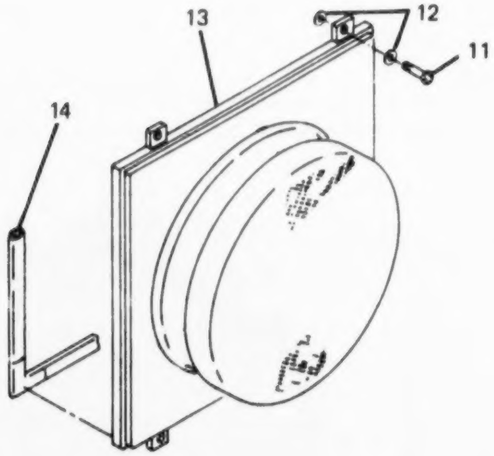
2. Coat seal (17) with adhesive and install. (Refer to paragraph 4-41)

3. Position shear plate (16) and install rivets (15). (Refer to paragraph 4-33)

ECU Return Panel

4. Attach weather seal (14) to ECU return panel (13) with adhesive. (Refer to paragraph 4-41)

5. Using installation tool, assemble two washers (12) and captive screw (11) at each of four locations on ECU return panel (13).



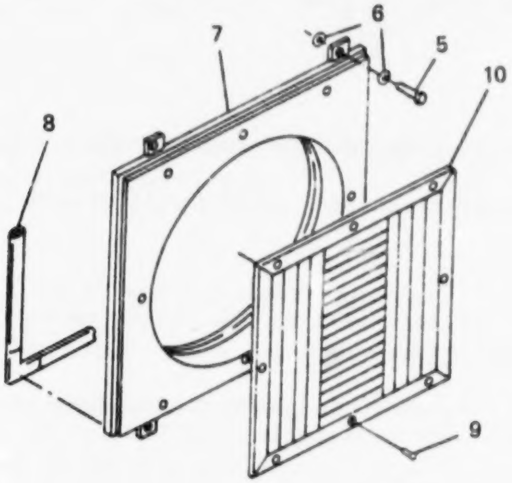
4-27. (cont)

ECU Intake Panel

6. Position vent cover grill (10) on ECU intake panel (7) and secure with rivets (9). (Refer to paragraph 4-33)

7. Attach weather seal (8) to ECU intake panel (7) with adhesive. (Refer to paragraph 4-41)

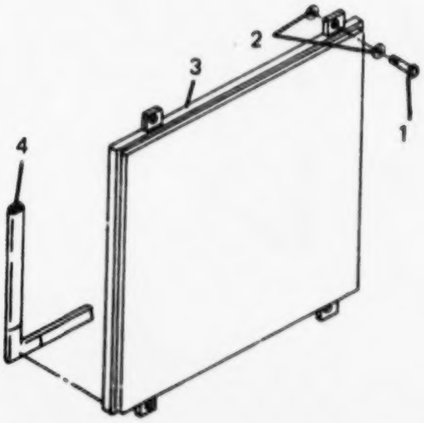
8. Using installation tool, assemble two washers (6) and captive screw (5) at each of four locations on ECU intake panel (7).



Sidewall Closeout Panel

9. Attach weather seals (4) to ECU intake and return closeout panels (3). (Refer to paragraph 4-41)

10. Using installation tool, assemble two washers (2) and captive screw (1) at each of four locations on ECU intake and return closeout panels (3).



4-27. (cont)

INSTALLATION

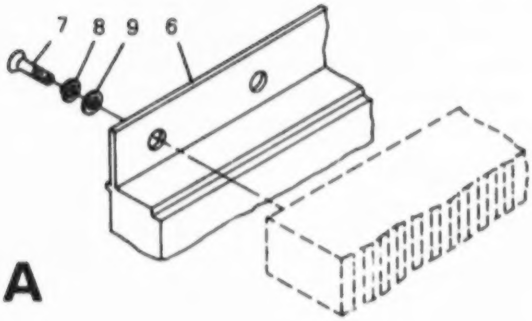
1. Apply sealing compound to interface areas of sidewall panel (6) and mating surfaces.

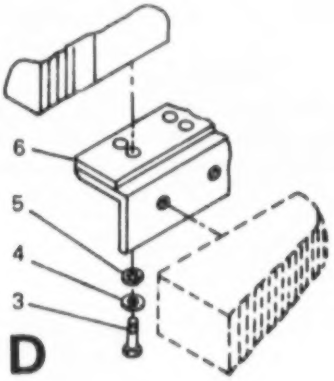
2. From outside shelter, position sidewall panel (6) on fixed floor and push inward until sidewall is against mating surfaces.

3. Align sidewall panel mounting holes with inserts in fixed roof and floor.

NOTE

Align mounting holes at sidewall panel corners and install bolts. Check that remaining holes and inserts are aligned and free from obstructions.



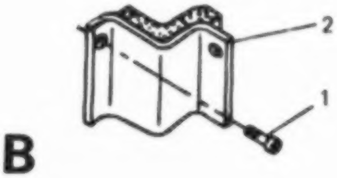


4. Install washers (9), lockwashers (8), and bolts (7) securing sidewall panel (6) to fixed roof.

5. Install washers (5), lockwashers (4) and bolts (3) securing sidewall panel (6) to fixed floor.

6. Align corner enclosures (2) with anchors in sidewall panel (6) and install screws (1).

7. Install ECU or closeout panels.



4-28. ROOF PANEL ASSEMBLY REPAIR

This task covers:

- a. Removal
- b. Disassembly
- c. Cleaning, Inspection
- d. Repair
- e. Assembly
- f. Installation

INITIAL SETUP

Special tools
Hand blind riveter, Appendix B, Item 2

Standard tools
General mechanics tool kit

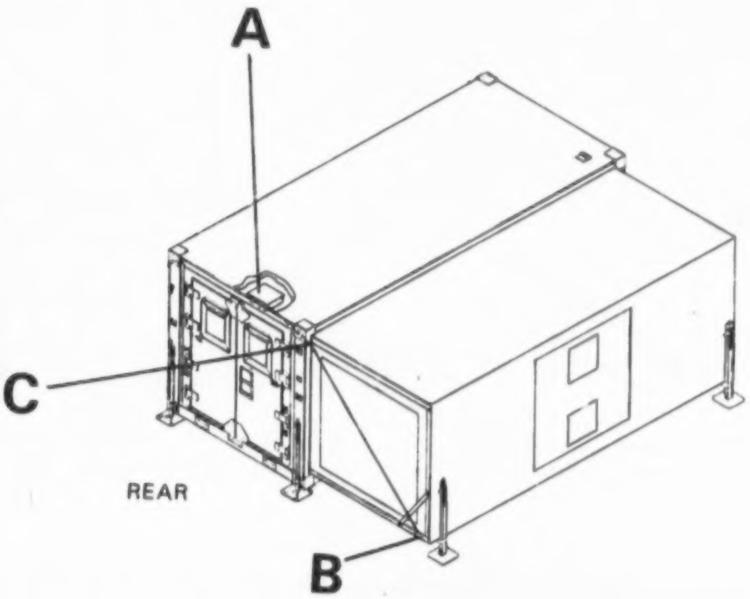
Personnel - 4

Materials
Adhesive, Item 2, Appendix E
Adhesive, Item 3, Appendix E

REMOVAL

Load Balancer and Cable Assembly

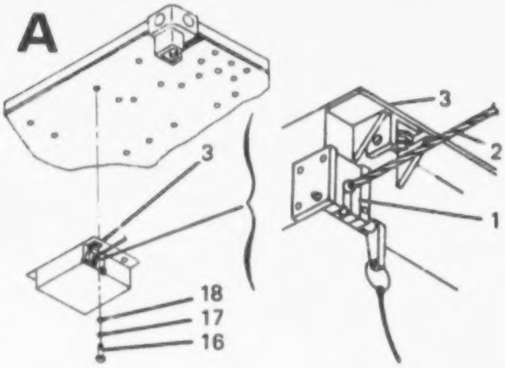
NOTE
Letters locate detail views described in following procedures.



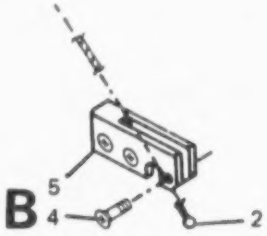
WARNING

Prior to removing load balancer from fixed roof, the hinged floor must be in stowed position with stop plate in down position to remove tension from support cable. The support cable bracket on hinged floor must then be removed to permit disconnecting support cable from hinged floor. Secure hinged floor to prevent accidental release.

4-28. (cont)



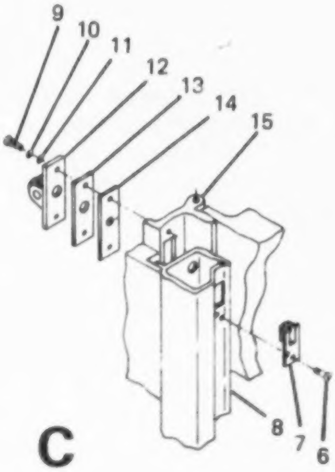
1. Lower hinged sidewall to hinged floor in accordance with paragraph 2-16.
2. Lift stop plates (1) from support cables (2) on both load balancers (3) mounted on fixed roof.
3. Lift hinged floor until almost closed then lower stop plate (1) to remove weight from support cables (2) and secure hinged floor in this position.
4. Remove screw (4) from cable guide bracket (5) and disengage support cable (2).



WARNING

Do not attempt to disassemble or repair load balancer. This item is a spring powered mechanism and injury or death to personnel may result if opened. Never completely release all the tension from the reel assembly or the cable wrapped around the drum will become tangled.

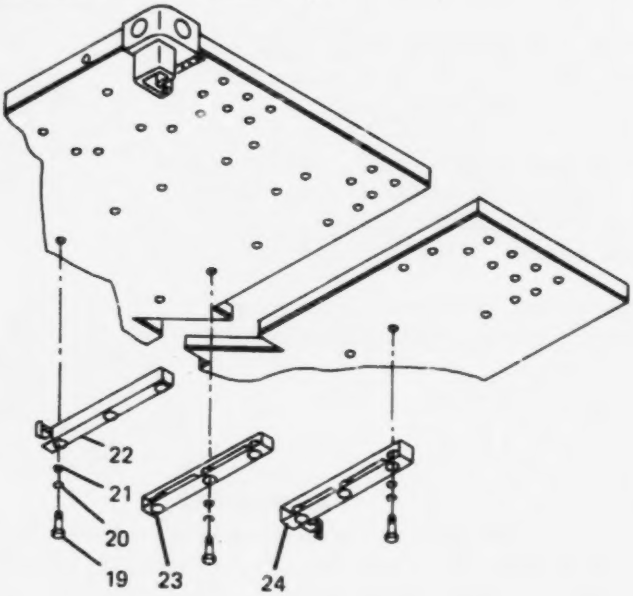
5. Return floor to stowed position.
6. Remove screws (6) securing roller assembly (7) to corner post (8).
7. Remove screws (9), lockwashers (10), and washers (11) securing roller assembly (12), plate (13), and seal (14) to endwall hinge (15).
8. Support load balancer (3) and remove screws (16), lockwashers (17), and washers (18).
9. Lower load balancer from fixed roof.
10. Pull support cable (2) through corner post (8) and remove roller assemblies (7 and 12), plate (13), and seals (14) from support cable.



4-28. (cont)

Stowage Brackets

11. Remove screws (19), lockwashers (20), and washers (21) and remove stowage brackets (22, 23, and 24).



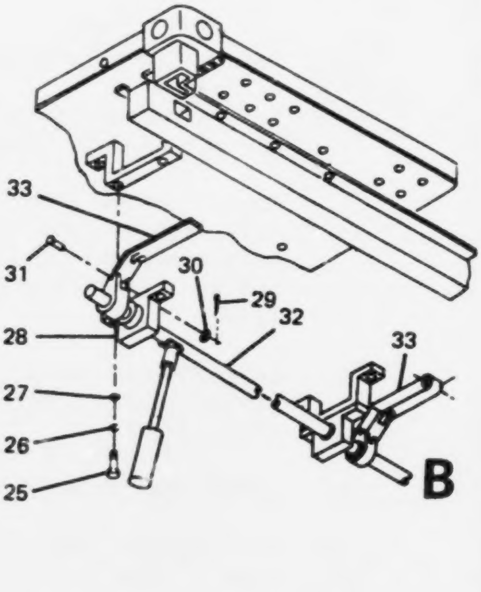
Solar Bar Assembly

12. Remove screws (25), lockwashers (26), and washers (27) and remove pillow blocks (28).

NOTE

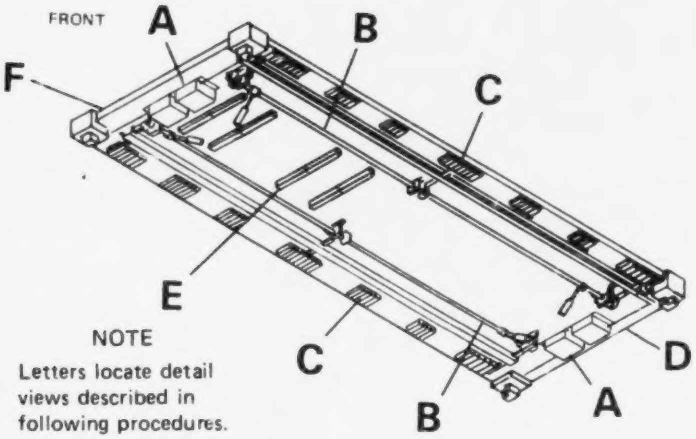
If hinged roof or hinge pins are removed from fixed roof hinges, solar bar assembly can be removed without removing push rod assemblies (33).

13. Remove cotter pins (29), washers (30), and pins (31) and remove solar bar assembly (32) from push rod assemblies (33).



4-28. (cont)

DISASSEMBLY

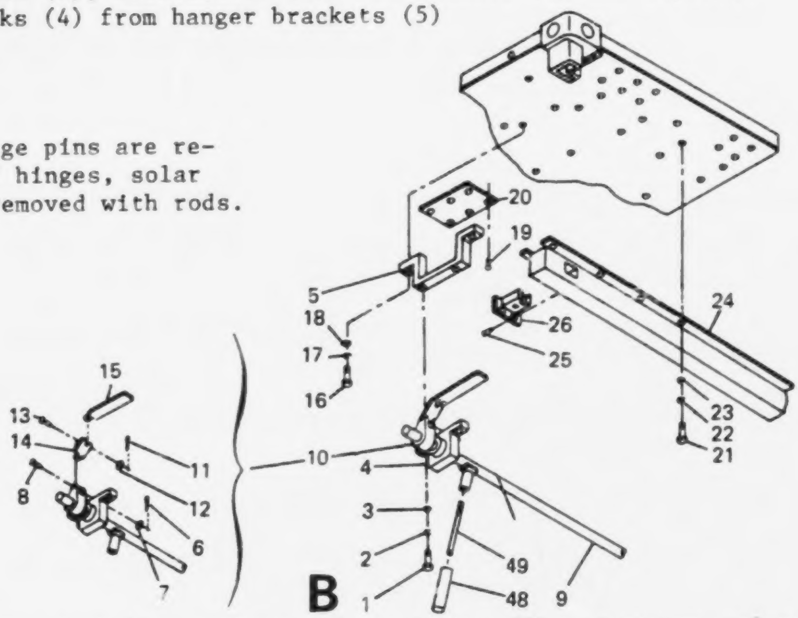


NOTE
Letters locate detail views described in following procedures.

1. Remove screws (1), lockwashers (2), and washers (3) and separate pillow blocks (4) from hanger brackets (5)

NOTE

If hinged roof or hinge pins are removed from fixed roof hinges, solar bar assembly can be removed with rods.



2. Remove cotter pins (6), washers (7), and pins (8) and remove solar bar (9) from push rod assemblies (10).

3. Remove cotter pins (11), washers (12), and pins (13) and separate push rods (14 and 15).

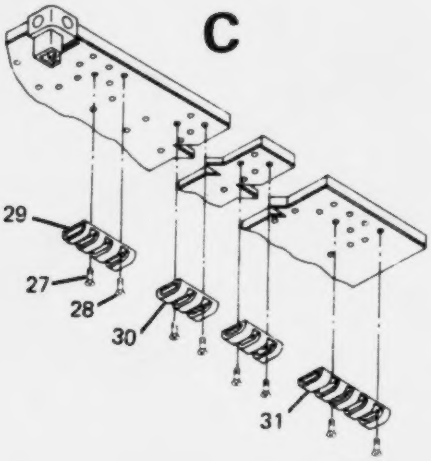
4. Remove screws (16), lockwashers (17), and washers (18) and remove hanger bracket (5).

5. Drill out rivets (19) and remove scuff plate (20). (Refer to paragraph 4-33)
6. Remove bolts (21), lockwashers (22), and washers (23) and remove fixed roof beam (24).

7. Drill out rivets (25) and remove push rod guide (26). (Refer to paragraph 4-33)

8. Remove handle grip (48) and handle (49) from solar bar. (14).

4-28. (cont)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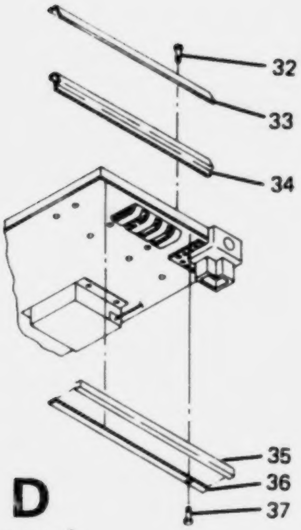
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NOTE

Hinged roofs or hinge pins need to be removed to remove fixed roof hinges and seals.

9. Remove screws (27 and 28) and remove hinges (29, 30, and 31).

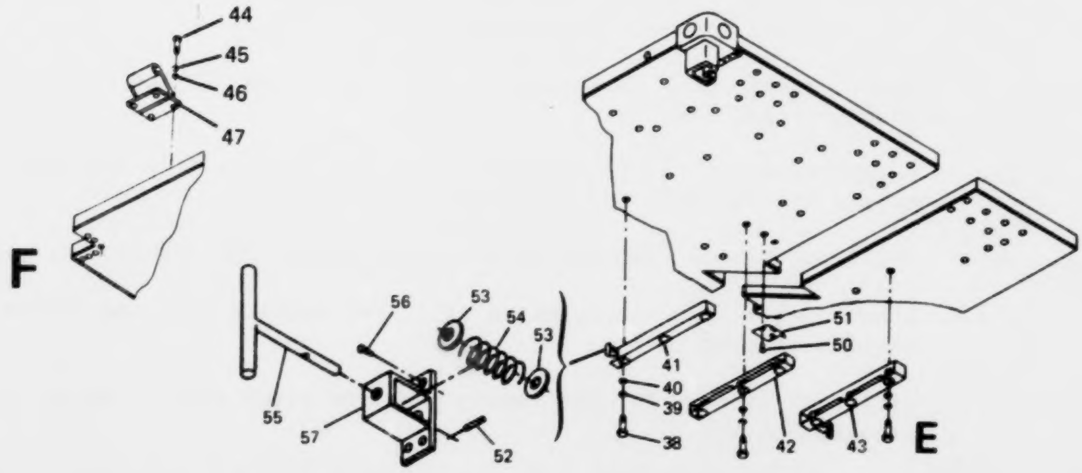
10. Drill out rivets (32 and 37) and remove seal cap (33), retainer strip (36) and seals (34 and 35). (Refer to paragraph 4-33)

11. Remove screws (38), lockwashers (39), and washers (40) and remove stowage brackets (41, 42, 43).

12. Remove screws (44), lockwashers (45), and washers (46) and remove handle (47).

13. Remove rivets (50) and removable light brackets (51).

14. Remove pins (52), washers (53), springs (54), handles (55), rivets (56), and plunger housing (57).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4-28. (cont)

CLEANING, INSPECTION

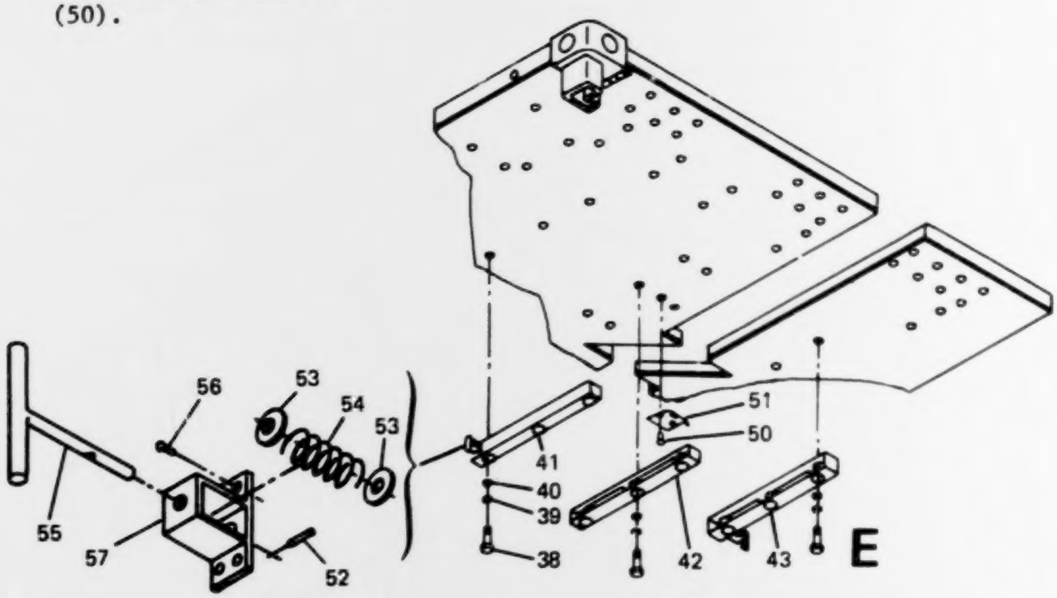
1. Clean panel and component surfaces.
2. Inspect mounting surfaces for corrosion and damage.
3. Inspect for and replace if necessary:
    a. Missing or damaged components
    b. Corrosion or paint damage.

REPAIR

1. Panel skin damage (Refer to paragraphs 4-32 through 4-43)
2. Corrosion or paint damage. (Refer to paragraph 4-44)

ASSEMBLY

1. Position stowage brackets (41, 42, and 43) and install washers (40), lockwashers (39) and screws (38).
2. Install plunger housing (57), rivets (56), handles (55), springs (54), washers (53), and pins (52).
3. Install removable light brackets (51) and rivets (50).



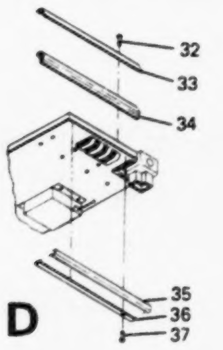
4-28. (cont)

4. Apply adhesive to seals (34 and 35) and mating surface. (Refer to paragraph 4-41)

5. Position retainer strip (36) and seal cap (33) and install rivets (32 and 37). (Refer to paragraph 4-33)

6. Position hinges (29, 30, and 31) and install screws (27 and 28).

7. Position rod guide (26) and install rivets (25). Refer to paragraph 4-33)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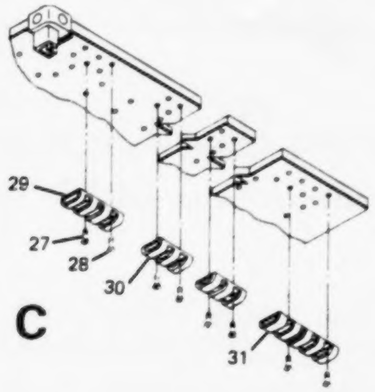
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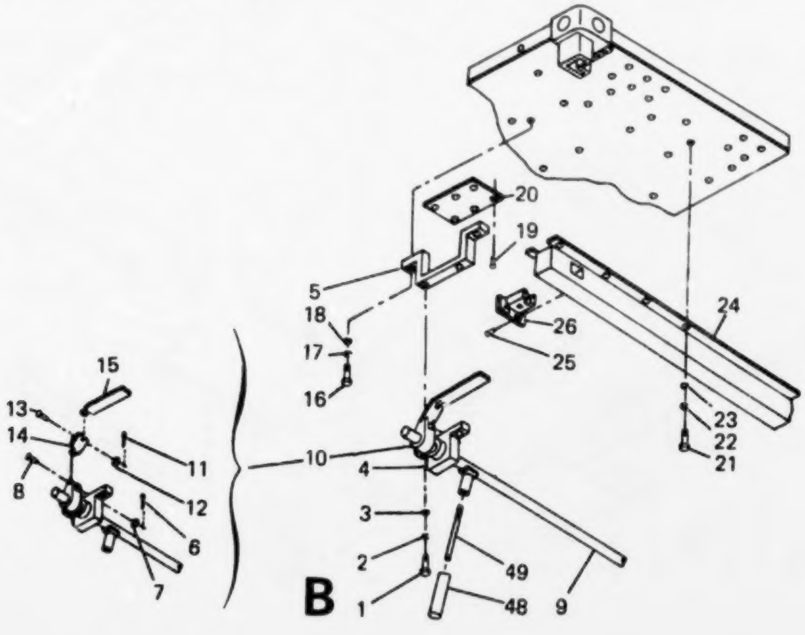
8. Position roof beam (24) and install washers (23), lockwashers (22), and bolts (21).

9. Position scuff plate (20) and install rivets (19). (Refer to paragraph 4-33)

10. Position hanger brackets (5) and install washers (18), lockwashers (17), and screws (16).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4-28. (cont)

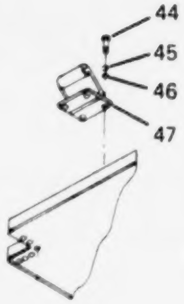
11. Assemble push rods (14 and 15) with pins (13), washers (12), and cotter pins (11).

12. Position and support solar bar (9) with push rods inserted in rod guides (26).

13. Install pins (8), washers (7), and cotter pins (6).

14. Position pillow blocks (4) on hanger brackets (5) and install washers (3), lockwashers (2), and screws (1).

15. Position handle (47) on top of fixed roof and install washers (46), lockwashers (45), and screws (44).



F

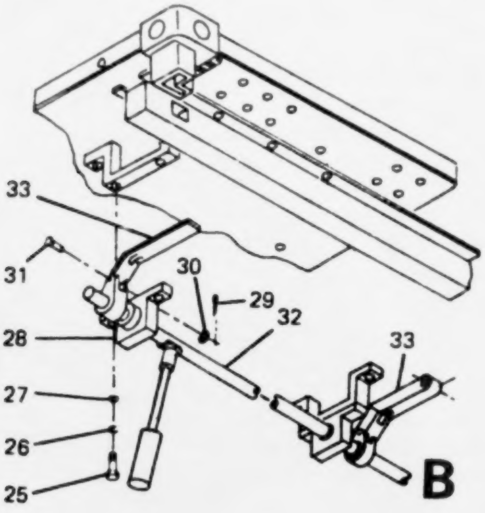
INSTALLATION

Solar Bar Assembly

1. Position solar bar assembly (32) with push rods inserted in rod guides and support solar bar.

2. Install pins (31), washers (30), and cotter pins (29).

3. Position pillow blocks (28) and install washers (27), lockwashers (26), and screws (25).



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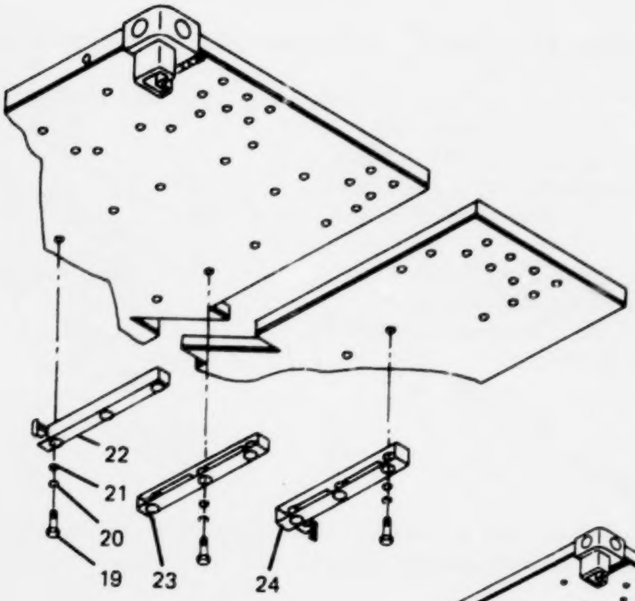
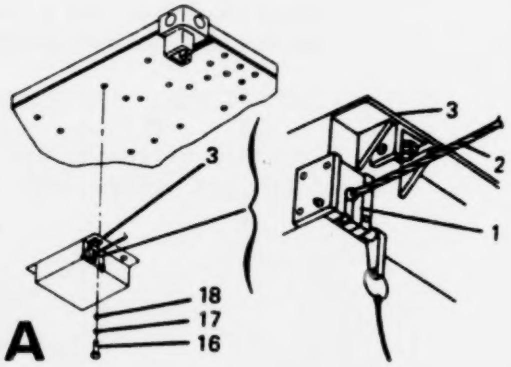
4-28. (cont)

Stowage Brackets

4. Position stowage brackets (22, 23, and 24) and install washers (21), lockwashers (20), and screws (19).



Load Balancer and Cable Assembly

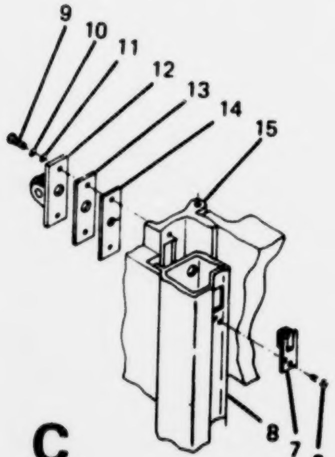


1. Position and support load balancer (3) on fixed roof and install washers (18), lockwashers (17), and screws (16).

2. Insert end of support cable (2) through roller assembly (12), plate (13), seal (14), and then pull through endwall hinge (15) and corner post (8).

3. Position seal (14), plate (13), and roller assembly (12) on endwall hinge (15) and install washers (11), lockwashers (10) and screws (9).

4. Position roller assembly (7) against corner post (8) and support cable (2), and install screws (6).

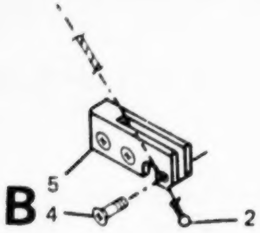


4-28. (cont)

5. Engage support cable (2) in cable guide bracket (5) and install screw (4).

6. Open stop plates (1) on both load balancers (3) mounted on fixed roof.

7. Raise hinged sidewall and complete extension of expandable side in accordance with paragraph 2-12.



4-29. FLOOR PANEL REPAIR

This task covers:
- a. Disassembly
- b. Cleaning, Inspection
- c. Assembly

INITIAL SETUP

Special Tools
- Blind bolt removal tool kit, Appendix B, Item 13
- Installation tool, Appendix B, Item 14

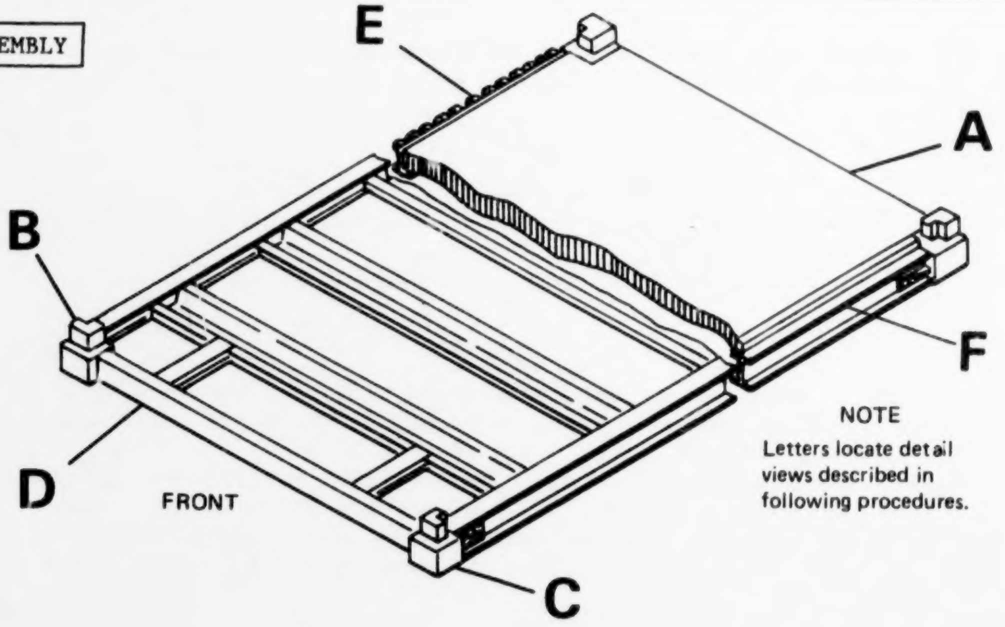
Standard Tools
- General mechanics tool kit

Personnel - 4

Equipment Condition
- Floor panel removed

Materials
- Adhesive, Item 3, Appendix E
- Sealing Compound, Item 19, Appendix E

DISASSEMBLY



NOTE
Letters locate detail views described in following procedures.

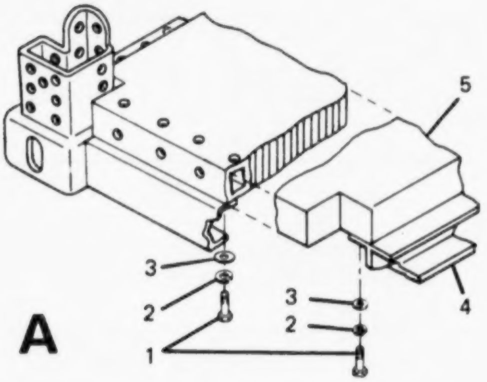
4-29. (cont)

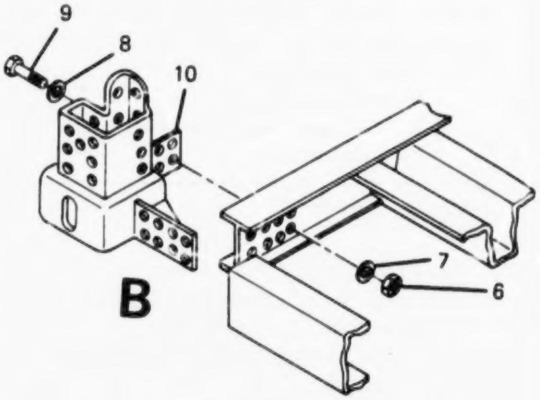
NOTE

Raise floor or turn over to remove base frame.

1. Remove screws (1), lockwashers (2), and washers (3) securing base frame (4) to floor panel (5).

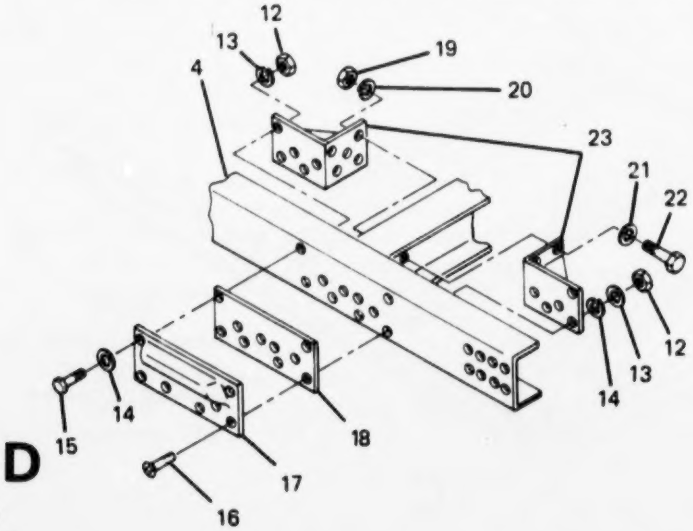
2. Remove nuts (6), lockwashers (7), washers (8), and bolts (9) securing lower ISO fittings (10 and 11) to base frame (4).





3. Remove nuts (12), lockwashers (13), washers (14), bolts (15), and screws (16) securing lower mobilizer fitting (17) and spacer (18) to base frame (4).

4. Remove nuts (19), lockwashers (20), washers (21), and bolts (22) securing brackets (23) to base frame (4).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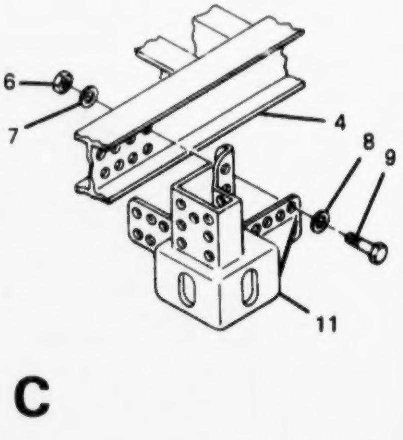
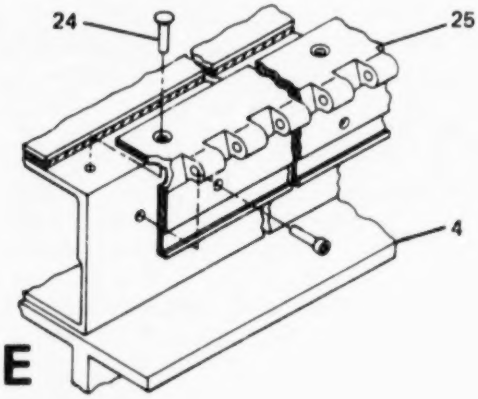
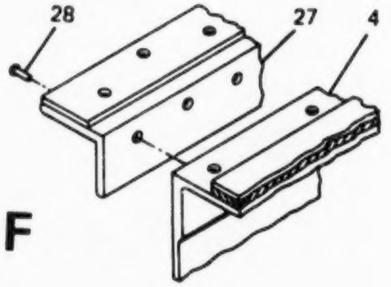


4-29. (cont)

5. Using blind bolt removal tool kit, remove 112 rivets (24) and two hinge edge members (25). (Refer to paragraph 4-33)

6. Using blind bolt removal tool kit, remove 112 rivets (26) and support angle assembly (27). (Refer to paragraph 4-33)





CLEANING, INSPECTION

1. Clean panel and component surfaces.

2. Inspect mounting surfaces for corrosion and damage.

3. Inspect for and replace if necessary:

   a. Missing or damaged components

   b. Corrosion or paint damage.

REPAIR

1. Panel skin damage (Refer to paragraphs 4-32 through 4-43)

2. Corrosion or paint damage. (Refer to paragraph 4-44)

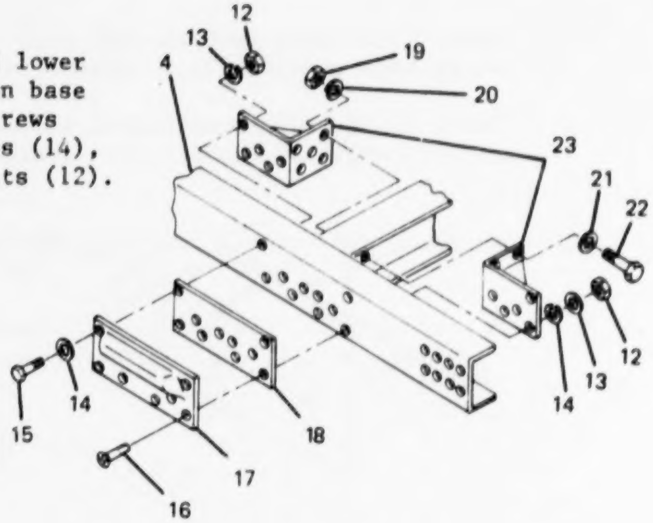
ASSEMBLY

1. Using installation tool, assemble support angle assembly (27) to base frame (4) with 112 rivets. (Refer to paragraph 4-33)

2. Using installation tool, assemble two hinge edge members (25) to base frame (4) with 112 rivets (24). (Refer to paragraph 4-33)
3. Position brackets (23) on base frame channel (4) and install bolts (22), washers (21), lockwashers (20), and nuts (19).

4-29. (cont)

4. Position spacer (18) and lower mobilizer fitting (17) on base frame (4) and install screws (16), bolts (15), washers (14), lockwashers (13), and nuts (12).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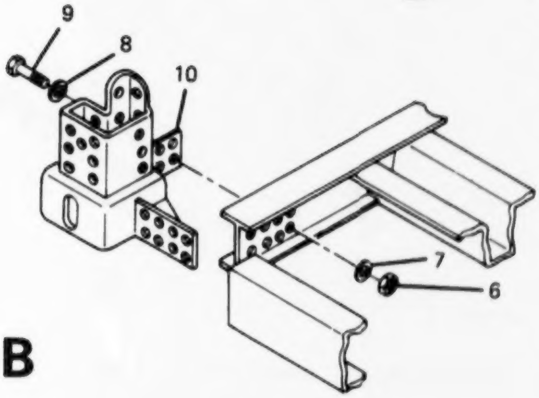

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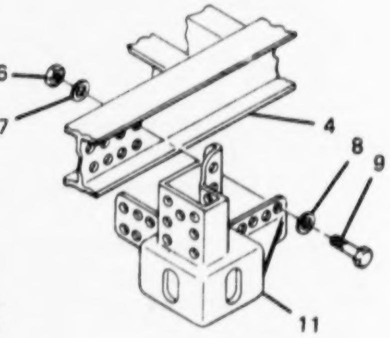
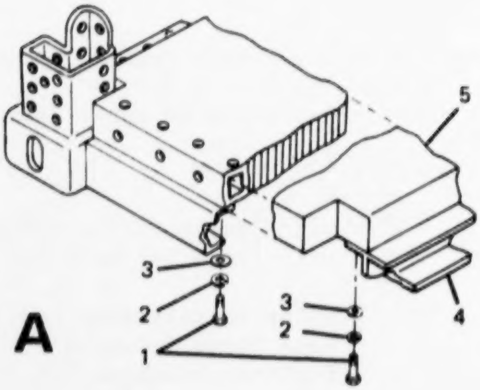


C

5. Position lower ISO fittings (10 and 11) on base frame (4) and install bolts (9), washers (8), lockwashers (7), and nuts (6).

6. Position base frame (4) on floor panel (5) and install washers (3), lockwashers (2), and screws (1).



A

4-30. CAMLOCK AND LATCH CAM HANDLE REPLACEMENT AND REPAIR

This task covers:

a. Removal	c. Repair
b. Cleaning, Inspection	d. Installation

INITIAL SETUP

Standard tools
General mechanics tool kit

REMOVAL

1. Remove cotter pin (1), washer (2), and pin (3) and remove latch cam handle (4)
2. Remove washers (5), spring washers (6), and camlock (7).

CLEANING, INSPECTION

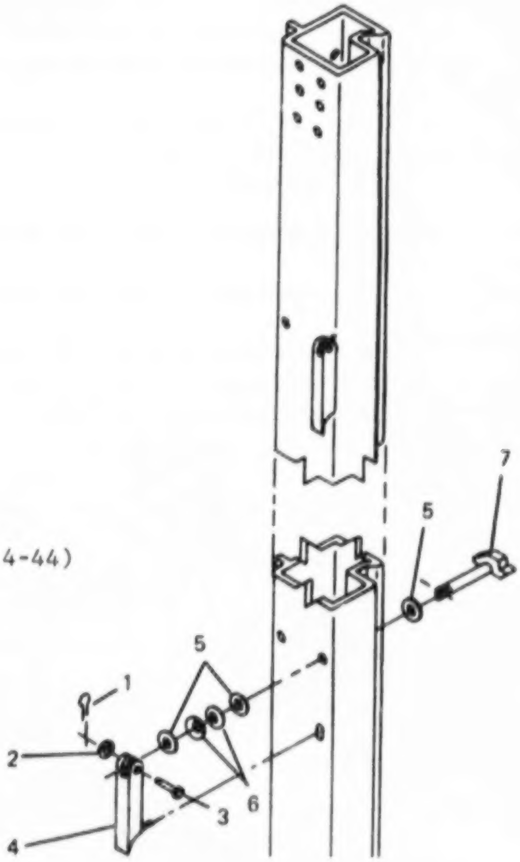
1. Clean camlock and latch cam handle.
2. Inspect for and replace if necessary:
   a. Missing or damaged components
   b. Corrosion or paint damage.

REPAIR

Corrosion or paint damage. (Refer to paragraph 4-44)

INSTALLATION

1. Position camlock (7) and install washers (5), spring washers (6), and latch cam handle (4).
2. Install pin (3), washer (2), and cotter pin (1).



NOTE

Compress springs slightly to insert pin.

4-31. EQUIPMENT CONTAINER REPLACEMENT AND REPAIR

This task covers:

a. Removal
b. Cleaning, Inspection
c. Repair
d. Installation

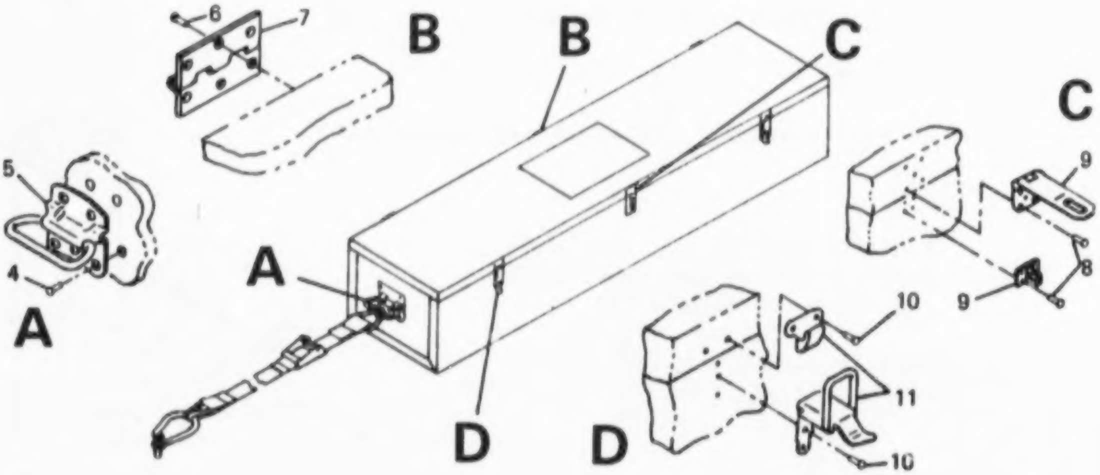
INITIAL SETUP

Special tools	Standard Tools
Hand blind riveter, Appendix B, Item 2	General mechanics tool kit

Personnel - 2

REMOVAL

1. Unscrew two tie-down rings (1) at the end of two strap assemblies (2) from floor panel.
2. Lift equipment container (3) from floor and remove from shelter.
3. Remove rivets (4) and chest handles (5). (Refer to paragraph 4-33)
4. Remove rivets (6) and hinges (7). (Refer to paragraph 4-33)
5. Remove rivets (8) and safety hasp (9). (Refer to paragraph 4-33)
6. Remove rivets (10) and draw pull catches (11). (Refer to paragraph 4-33)



CLEANING, INSPECTION

1. Clean equipment container and component surfaces.
2. Inspect mounting surfaces for corrosion and damage.

4-31. (cont)

3. Inspect for and replace if necessary:

    a. Missing or damaged components.

    b. Corrosion or paint damage.

REPAIR

1. Corrosion or paint damage (Refer to paragraph 4-44)

2. Replace damaged tie-down ring or strap assembly.

INSTALLATION

1. Position draw pull catches (11) on equipment container (3) and secure with rivets (10). (Refer to paragraph 4-33)

2. Position safety hasp (9) on equipment container (3) and secure with rivets (8). (Refer to paragraph 4-33)

3. Position hinges (7) on equipment container (3) and secure with rivets (6). (Refer to paragraph 4-33)

4. Position chest handles (5) on equipment container (3) and secure with rivets (4). (Refer to paragraph 4-33)

5. Position equipment container (3) on floor panel.

6. Install two tie-down rings (1) at the end of two strap assemblies (2) in holes in floor panel to secure equipment container (3) to floor.

NOTE

The procedures in paragraphs 4-31 through 4-43 are typical and apply for all panel surfaces.

4-32. DRYING WATER-SOAKED AREAS IN PANELS.

a. Care shall be taken to prevent water from entering panel core material, since it is very difficult to remove. When damage occurs, the punctured panel skin shall be temporarily protected to prevent entry of water until repair can be made. If water has been allowed to enter panel, the core material shall be dried prior to skin repair.

b. Position heat lamps around damaged area. Adjust lamps so that panel surface temperature does not exceed 200°F (93.3°C).

c. Allow heat lamps to remain in position until core material surrounding damaged area is thoroughly dry.

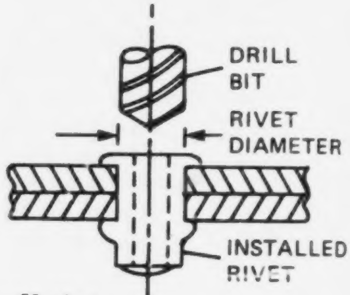
4-32. (cont)

NOTE

Drying time will vary and is determined by experience and amount of moisture in panel. Core material will feel hard and brittle when dry.

d. After core material is thoroughly dried, repair panel in accordance with the applicable repair task.

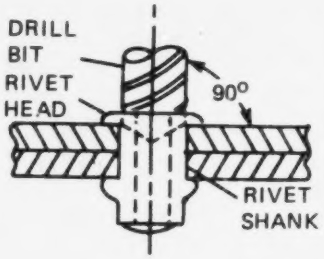
4-33. BLIND RIVET REMOVAL AND INSTALLATION.


DRILL BIT
RIVET DIAMETER
INSTALLED RIVET

a. Remove blind rivets as follows:

WARNING

Wear safety goggles for eye protection from flying metal chips.

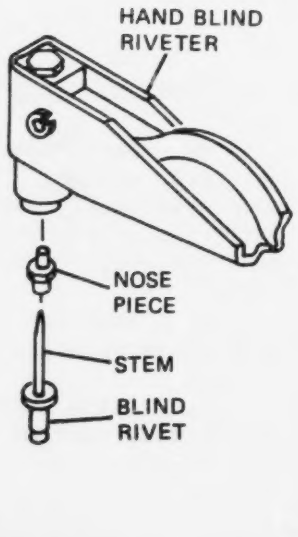

DRILL BIT
RIVET HEAD
90°
RIVET SHANK

(1) Select drill bit the same diameter as installed blind rivet.

(2) Install selected drill bit in hand drill chuck.

(3) Hold drill perpendicular to the surface to prevent enlargement or damage to existing hole.

(4) Drill through center of rivet just deep enough to sever rivet head from shank.


HAND BLIND RIVETER
NOSE PIECE
STEM
BLIND RIVET

(5) Remove remainder of rivet with a pin punch.

(6) Deburr rivet hole.

b. Install blind rivets as follows:

(1) Select proper diameter and length of blind rivet (Items 13-16, Appendix E).

(2) Select appropriate nose piece for hand blind riveter and install nose piece.

(3) Wet rivet with sealant (Item 18, Appendix E and insert rivet in hole.

4-33. (cont)

(4) Holding hand blind riveter at right angle to work, install on blind rivet stem.

(5) Push against work with just enough force to firmly seat rivet and prevent part separation.

(6) Actuate and pull rivet until stem breaks.

(7) Trim broken stem flush with rivet head.

(8) Firmly press on installed rivet to check tightness of installation.

(9) Remove and replace in accordance with procedure if installation is unacceptable.

c. Blind bolt removal.

(1) The blind bolt (BP-T & B100-T) can be removed by using the proper size blind bolt removal tool kit and any portable electric drill with a rated speed of no more than 1250 RPM.

(2) The tools in this kit are illustrated on page 4-183, and are tabulated on page 4-184.

(3) The fastener removal consists of four operations:

(a) Operation I - Drill pin. (See page 4-186)

(b) Operation II - Knock out drilled pin and remove upper portion of pin and lock collar. (See page 4-187)

(c) Operation III - Counterbore sleeve. (See page 4-188)

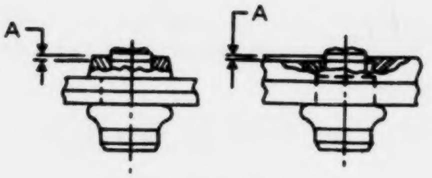
(d) Operation IV - Knock out counterbored sleeve and remove head of sleeve. (See page 4-189)

NOTE

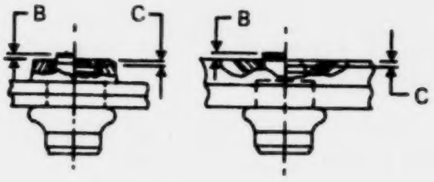
The illustration of the operations for removal show a countersunk blind bolt. The removal of a protruding head blind bolt is the same. A micro-limit tool is used with the counterbore cutter in Operation III to control the depth of the cut.

4-33. (cont)

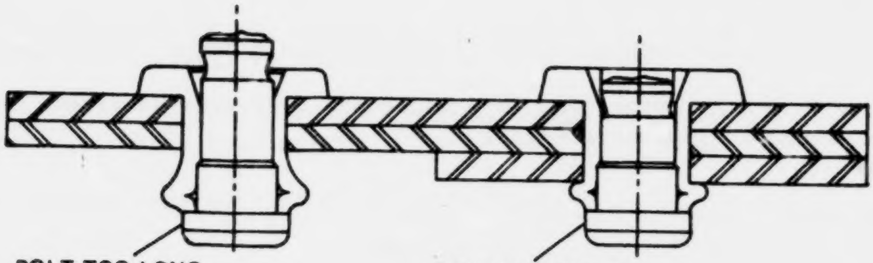
TABLE I VISUAL INSPECTION TABLE				
Rivet Dia.	Collar Position "A" max.	Lock Position		Minimum Blind Head Diameter
		"B" max. above	"C" max. below	
3/16"	.022"	.012"	.012"	.238"
1/4"	.029"	.015"	.015"	.315"



INSPECTION OF LOCKING COLLAR POSITION



INPSECTION OF PIN POSITION



BOLT TOO LONG PIN WILL PROTRUDE TOO FAR

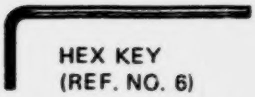
BOLT TOO SHORT PIN WILL EXTEND TOO FAR IN HEAD

A - Maximum allowable distance of locking collar above or below fastener head.
B - Maximum allowable distance of top of land on pin above fastener head.
C - Maximum allowable distance of top of land on pin below fastener head.

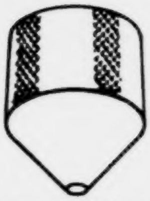
4-33. (cont)

Blind Bolt Removal Tool Kits

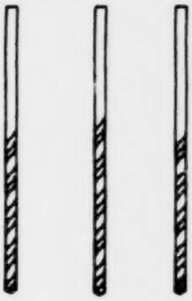
Fasteners	Nom. Size	Kit No.
BP-T6, B100-T6 BP-T8, B100-T8	3/16" 1/4"	105-60 105-80



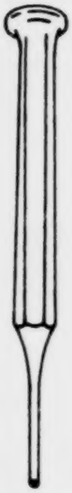
HEX KEY
(REF. NO. 6)



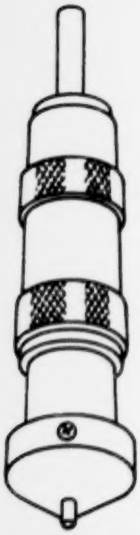
DRILL BUSHING
(REF. NO. 1)



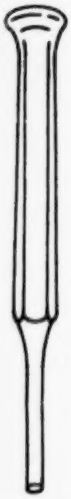
DRILLS
(REF. NO. 2)



PIN PUNCH
(REF. NO. 3)



MICRO-LIMIT
TOOL ASSEMBLY
(REF. NO. 4)

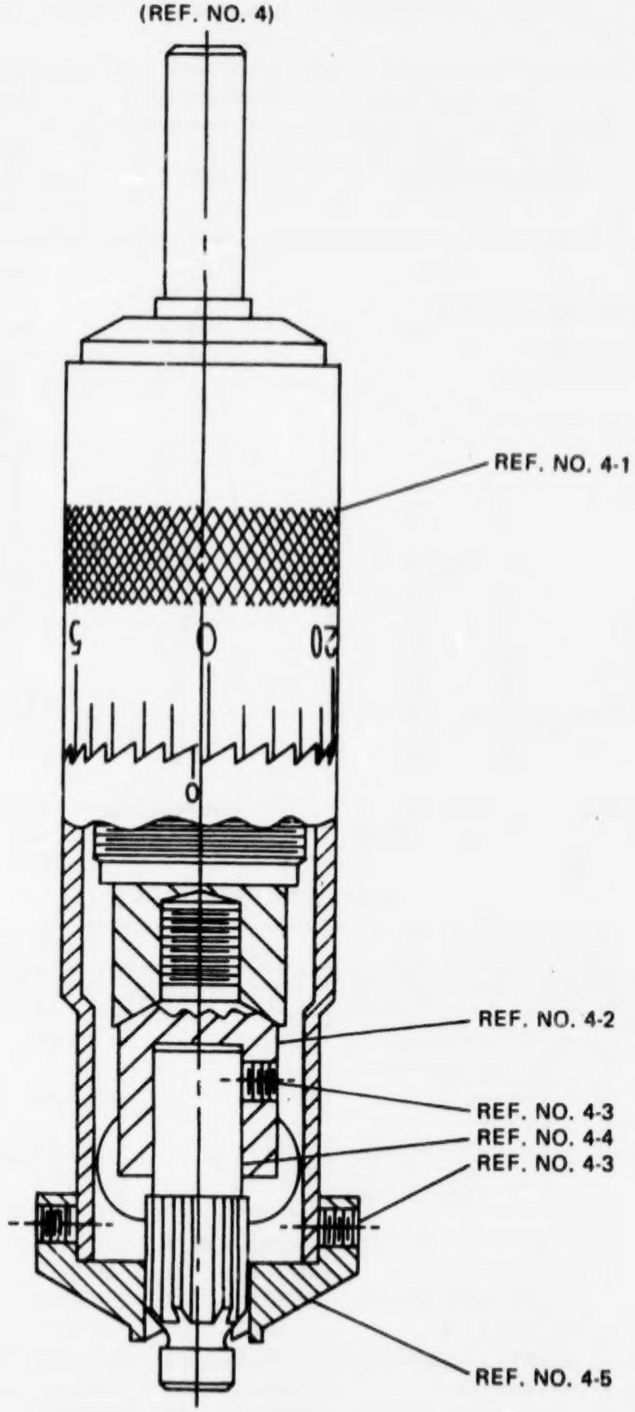


SLEEVE PUNCH
(REF. NO. 5)

COMPOSITE PARTS LIST

Ref. No.	Description	105-60		105-80	
		Part No.	Req.	Part No.	Req.
4	Micro-Limit Tool Assembly	103601	1	103602	1
4-1	Micro-Limit Tool	103623	1	103623	1
4-2	Cutter Holder	110672-6	1	110672-6	1
4-3	Set Screw	501775	3	501775	3
4-4	Cutter	103606	1	103607	1
4-5	Anti-Rotation	103620	1	103621	1
3	Pin Punch	503010	1	503012	1
5	Sleeve Punch	503013	1	503015	1
2	Drill	503000	3	503001	3
1	Drill Bushing	103616	1	103617	1
6	Hex Key	502443	1	502443	1
	Case	103567	1	103567	1

4-33. (cont)


(REF. NO. 4)
REF. NO. 4-1
5
0
20
0
REF. NO. 4-2
REF. NO. 4-3
REF. NO. 4-4
REF. NO. 4-3
REF. NO. 4-5

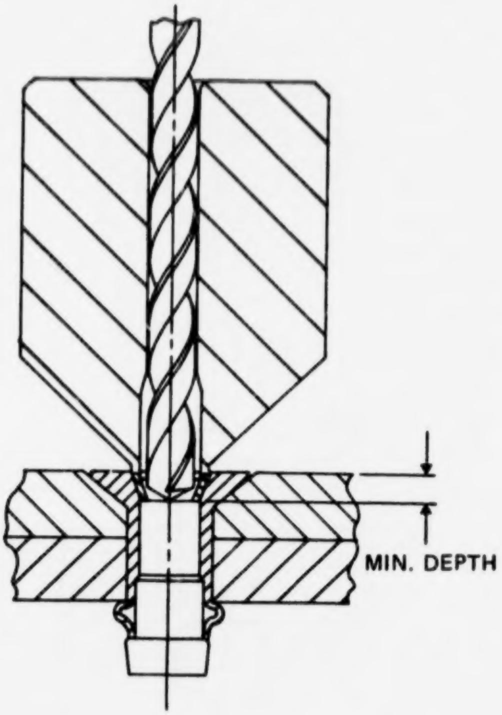
Micro-Limit Tool Assembly

4-33. (cont)

Drill

Nom. Size	Drill	Size	Min. Depth*	Bushing
3/16"	503000	.1200	.070	103616
1/4"	503001	.1562	.090	103617

* MAX. Depth + .020



d. Operation I - Drill Pin

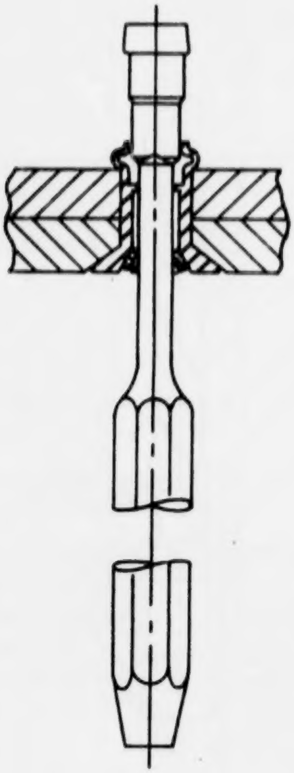
(1) Place the drill bushing over the pin so that it rests squarely on the lock collar.

(2) Using a drill with a maximum of 1250 RPM, drill to lock collar depth.

4-33. (cont)

Pin Punch

Nom. Size	Part No.	Size
3/16"	503010	3/32"
1/4"	503012	3/32"



e. Operation II - Knock Out Pin

(1) Position pin punch on the fastener and drive fastener pin out.

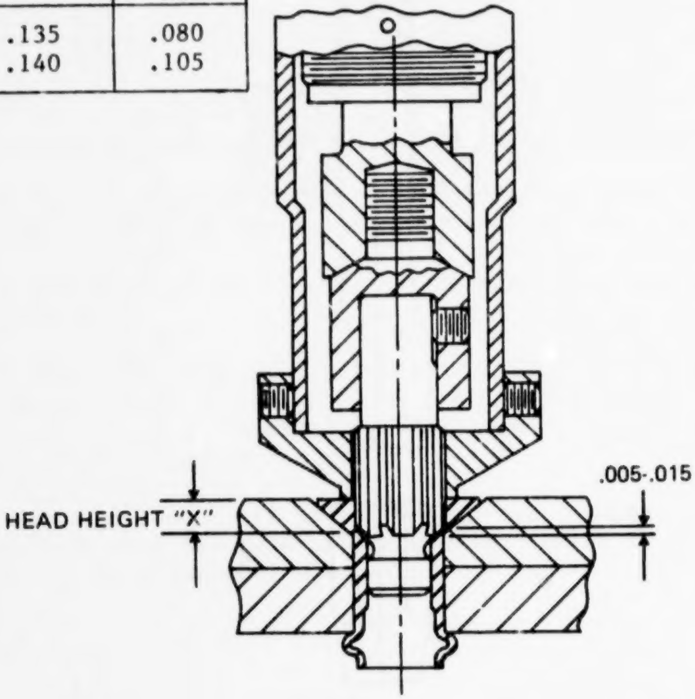
(2) Remove remaining portion of pin and lock collar with any sharp pointed instrument.

4-33. (cont)

Cutter

Nom.Size	Holder	Cutter	Size	Anti-Rotation Cap
3/16"	103611	103606	3/16"	103620
1/4"	103611	103607	1/4"	103621

Head Height		
Protruding Head		C/Sunk Head
3/16"	.135	.080
1/4"	.140	.105



f. Operation III - Counterbore Sleeve

(1) Adjust micro-limit tool to within .005 to .015 less than dimension "X".

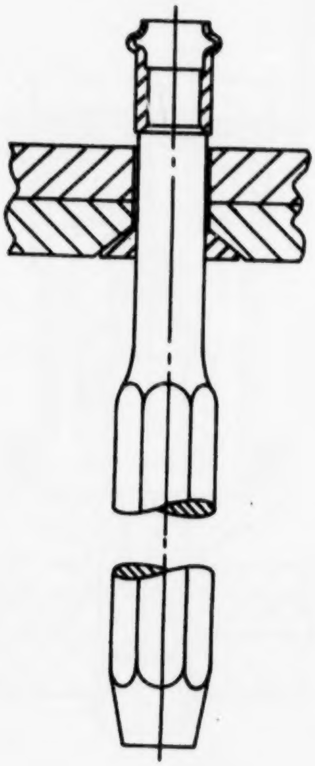
(2) Place anti-rotation cap firmly against head of fastener.

(3) Counterbore to desired depth.

4-33. (cont)

Sleeve Punch

Nom. Size	Part No.	Size
3/16"	503013	3/16"
1/4"	503015	1/4"



g. Operation IV - Knock Out Sleeve

(1) Position the sleeve punch in the sleeve and drive out lower portion of the sleeve.

(2) Tip the sleeve punch slightly and lift out the head of the fastener.

4-33. (cont)

h. Tool Selection and Single Action Installation Sequence

NOTE

3/16" Fasteners are color identified green on pintail, shear cap or shear flange.

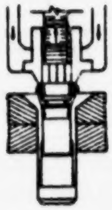
SINGLE ACTION FASTENERS	DIA. DASH No.	NOM. DIA.	INSTALLATION TOOL SINGLE ACTION	NOSE ASSEMBLY SINGLE ACTION
MS90353S (SB100-T) MS90354S (SBP-T) SB100-EU & SBP-EU OSB100-T & OSBP-T	06	3/16	115	99-681
MS90353 (B100-T) MS90354 (BP-T) MS21140 (B 100-EU) MS21141 (BP-EU OB 100-T OBP-T	08	1/4	115	99-591

(1) During the initial part of the driving operation, the sleeve is squeezed between the head of the pin and the nose of the rivet tool.

(2) The head of the pin upsets the sleeve to form a strong, bulbed head on the blind side.

(3) When the blind head has been formed, the tool automatically forces the locking collar (at the pintail end of the sleeve) into the conical space between the recess in the head and the locking groove in the pin. This locks the parts together permanently.

(4) Pin is broken off in tension at the breakneck groove, substantially flush with the head of the sleeve. There is no projecting pin left to be cut off in a separate operation.

1


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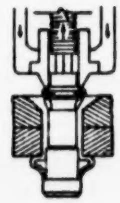

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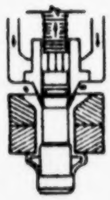
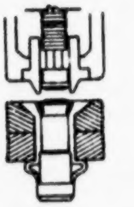


4


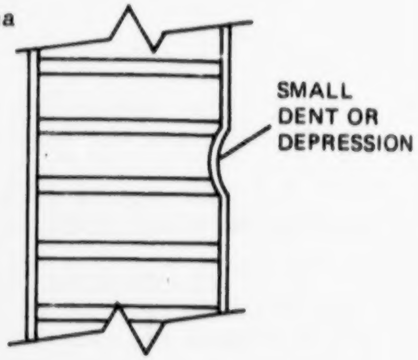
4-34. REPAIR OF SMALL DENT OR DEPRESSION.

NOTE

The following procedure covers repair of small dents or depressions in any shelter panel skin (damaged area not exceeding 2 square in. (12.9 sq. cm) or 0.25 in. 6.4 mm) deep and no evidence of delamination).

WARNING

Methylethylketone is flammable and toxic and shall be used only in a well-ventilated area away from all sparks or open flame. Gloves should be worn during use.



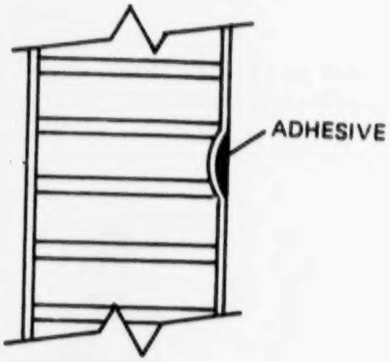
a. Remove all traces of paint from damaged area with sandpaper (Item 17, Appendix E).

b. Wipe sanded surface with clean cloth (Item 5, Appendix E) dampened in solvent (Item 20, Appendix E) and immediately wipe solvent from surface with a clean, dry cloth.

c. Mask sanded surface with masking tape (Item 22, Appendix E).

d. Mix small quantity of adhesive (Item 1, Appendix E) in accordance with manufacturer's instructions.

e. Using spatula or putty knife, fill damaged area with adhesive.



f. Apply heat using tripod base heat lamp, Appendix B, Item 16, at 200° F (93.3°C) for 40 to 60 minutes to fully cure adhesive. Alternate cures: 150° F for 4 hours or 75° F for 72 hours.

g. Sand surface of cured adhesive to conform to surrounding area.

h. Remove masking tape and clean repaired surface.

i. Refinish in accordance with paragraph 4-44.

4-35. REPAIR OF DEPRESSION OR SMALL PUNCTURE.

NOTE

The following procedure covers repair of a depression or small puncture in any shelter panel skin (depression exceeding 2 square in. (12.9 sq cm) or deeper than 0.25 in. (6.4 mm) but not larger than 4 square in. (25.8 sq cm) or puncture not larger than 1 square in. (6.5 sq cm)).

WARNING

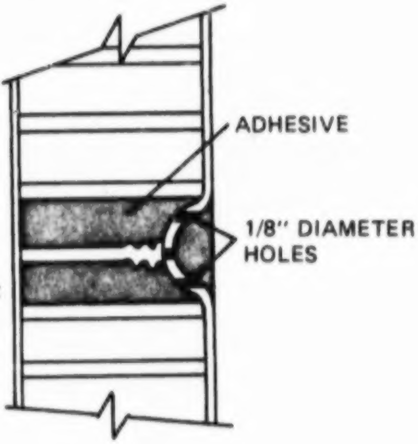
Wear safety goggles for eye protection from flying metal chips.

a. Drill two 1/8 in. (3.18 mm) diameter holes within damaged area.

b. Dry panel per paragraph 4-32, if required.

c. Mix small quantity of adhesive (Item 1, Appendix E) in accordance with manufacturer's instructions.

d. Transfer adhesive to caulking gun and inject adhesive through two drilled holes to fill core cells completely.



e. Apply heat using tripod base heat lamp, Appendix B, Item 16, at 200°F (93.3°C) for 40 to 60 minutes to fully cure adhesive. Alternate cures: 150° F for 4 hours or 75° F for 72 hours.

f. Check by tapping damaged area to ensure complete filling of cells.

g. Sand damaged area with sandpaper (Item 17, Appendix E) to remove all traces of paint and excess adhesive.

WARNING

Methylethylketone is flammable and toxic and shall be used only in a well-ventilated area away from all sparks or open flame. Gloves should be worn during use.

4-35. (cont)

h. Wipe sanded surface with clean cloth (Item 5, Appendix E) dampened in solvent (Item 20, Appendix E) and immediately wipe solvent from surface with a clean, dry cloth.

i. Mask sanded surface with masking tape (Item 22, Appendix E).

j. Mix small quantity of adhesive in accordance with manufacturer's instructions.

k. Using spatula or putty knife, fill damaged area with adhesive.

l. Apply external heat source at 200°F (93.3°C) for 40 to 60 minutes to fully cure adhesive.

m. Sand surface of cured adhesive to conform to surrounding area.

n. Remove masking tape and clean repaired surface.

o. Refinish in accordance with paragraph 4-44.

4-36. REPAIR OF PUNCTURE WITH MINIMAL DAMAGE TO CORE.

NOTE

The following procedure covers repair of puncture in any shelter panel skin with minimal core damage, (damaged area not exceeding 14 square in. (90.3 sq cm)). Use hand router to cut patches and openings.

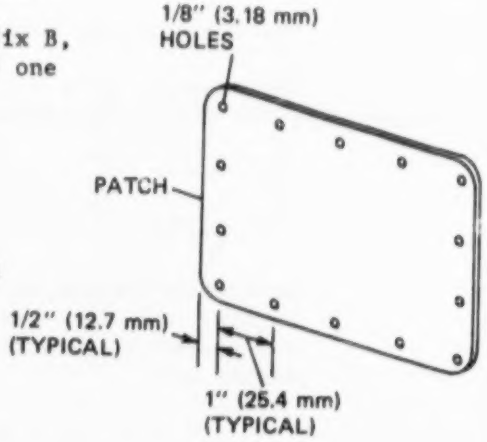
a. Dry panel per paragraph 4-32, if required.

b. Using portable electric router, Appendix B, Item 15, cut aluminum patch (Item 4, Appendix E) one inch larger all around than damaged area.

WARNING

Wear safety goggles for eye protection from flying metal chips.

c. Layout and drill holes as shown.



4-36. (cont)

d. Center patch over damaged area and mark patch outline on panel skin.

e. Sand all paint from damaged panel skin within marked area, with sandpaper (Item 17, Appendix E).

f. Center patch over damaged area and drill No. 30 diameter holes in panel skin. Use holes in patch as a template.

g. Index patch and panel skin with a mark to allow patch to be replaced in same orientation.

h. Deburr all drill holes.

WARNING

Methylethylketone is flammable and toxic and shall be used only in a well-ventilated area away from all sparks or open flame. Gloves should be worn during use.

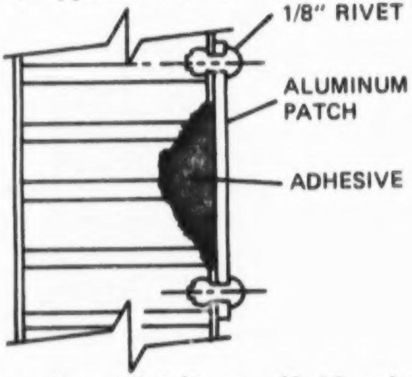
i. Wipe damaged area and patch with a clean cloth (Item 5, Appendix E) dampened in solvent (Item 20, Appendix E) and immediately wipe solvent from surfaces with a clean, dry cloth. Do not allow solvent to get into exposed core.

j. Mix sufficient amount of adhesive (Item 1, Appendix E) in accordance with manufacturer's instructions.

k. Pack adhesive in puncture and all exposed core cells. Use mixing sticks (Item 21, Appendix E) to pack adhesive and obtain a smooth surface.

l. Apply a thick film of remaining adhesive to mating surface of patch.

m. Place patch over prepared area in same orientation used in step f.



n. Align holes and, using hand blind riveter, install 1/8 in. (3.18 mm) diameter blind rivets (Items 15-16, Appendix E). (Refer to paragraph 4-33)

o. Clean repaired surface.

p. Caulk around patch. (Refer to paragraph 4-43)

q. Refinish in accordance with paragraph 4-44.

4-37. REPAIR OF PUNCTURE WITH CORE FRACTURE.

NOTE

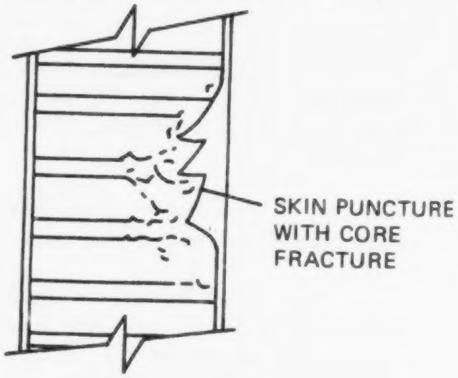
The following procedure covers repair of any shelter panel punctured skin with core fracture, (damaged area not exceeding 25 square in. (161 sq cm)). Use hand router to cut patches and openings.

WARNING

Wear safety goggles for eye protection from flying metal chips.

a. Dry panel per paragraph 4-32, if required.

b. Cut an opening through panel skin with a portable electric router, Appendix B, Item 15, that is one inch greater than damaged area. Avoid sharp corners in opening.

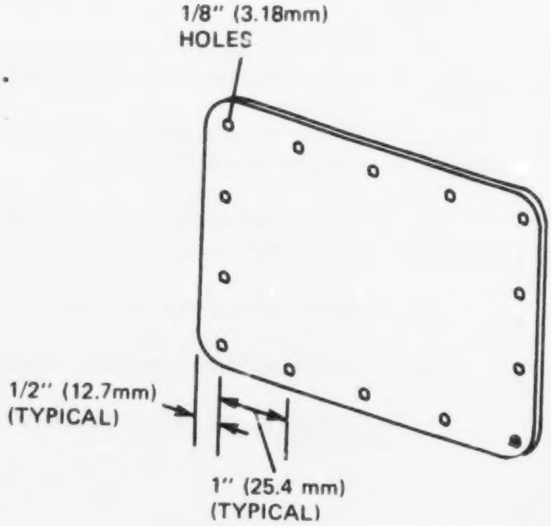


c. Peel damaged portion of skin from core by lifting and rolling skin.

d. Remove all loose core from exposed core area with compressed air.

e. Cut aluminum patch (Item 4, Appendix E) one inch larger all around than cutout opening.

f. Layout and drill holes as shown.



g. Mix sufficient amount of adhesive (Item 1, Appendix E) in accordance with manufacturer's instructions.

h. Pack adhesive in core cells to fill exposed area above surface of panel skin.

i. Apply heat using tripod base heat lamp, Appendix B, Item 16, at 200°F (93.3°C) for 40 to 60 minutes to fully cure adhesive. Alternate cures: 150° F for 4 hours or 75° F for 72 hours.

j. Sand cured adhesive with sandpaper (Item 17, Appendix E) to obtain a smooth contour with surface of panel skin.

4-37. (cont)

k. Center patch over adhesive-filled area and mark patch outline on panel skin.

l. Sand all paint from damaged panel skin within marked area.

m. Center patch over filled area and drill No. 30 diameter holes in panel skin. Use holes in patch as a template.

n. Index patch and panel skin with a mark to allow patch to be replaced in same orientation.

o. Deburr all drill holes.

WARNING

Methylethylketone is flammable and toxic and shall be used only in a well-ventilated area away from all sparks or open flame.

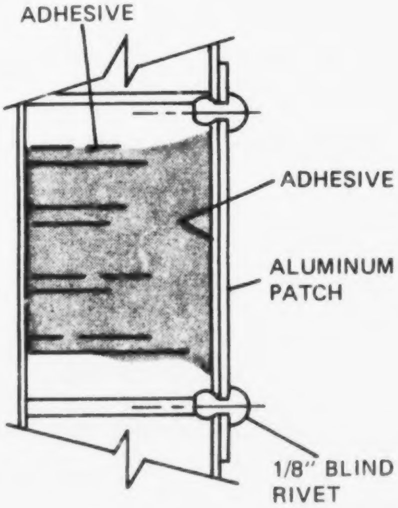
p. Wipe damaged area and patch with a clean cloth (Item 5, Appendix E) dampened in solvent (Item 20, Appendix E) and immediately wipe solvent from surfaces with a clean, dry cloth.

q. Mix sufficient amount of adhesive in accordance with manufacturer's instructions to coat one side of patch.

r. Apply a thick film of adhesive to mating surface of patch.

s. Place patch over prepared area in same orientation used in step k.

t. Align holes and, using hand blind riveter, install 1/8 in. (3.18 mm) diameter blind rivets (Items 15-16, Appendix E). (Refer to paragraph 4-33.)



u. Clean repaired surface.

v. Caulk around repair patch. (Refer to paragraph 4-43.)

w. Refinish in accordance with paragraph 4-44.

4-38. REPAIR OF DAMAGE WITH EXTENDED CRACKS.

NOTE

The following procedure covers repair of extended cracks (such as a long cut) in panel skin, (damaged area does not exceed 36 in. (91.44 cm) square).

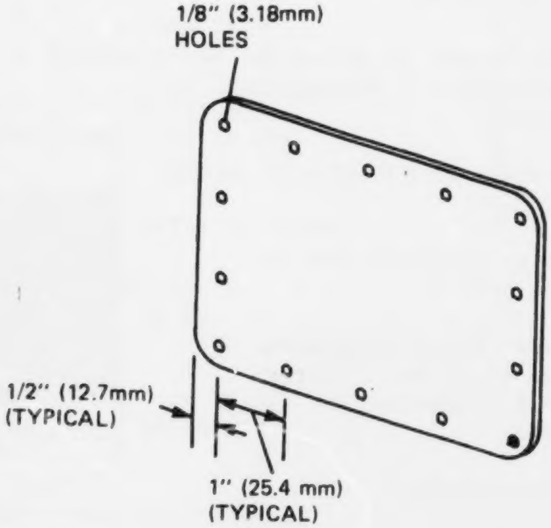
a. Dry panel per paragraph 4-32, if required.

b. Using portable electric router, Appendix B, Item 15, cut aluminum patch (Item 4, Appendix E) one inch larger all around than damaged area.

WARNING

Wear safety goggles for eye protection from flying metal chips.

c. Layout and drill 1/8 in. (3.18 mm) holes as shown.

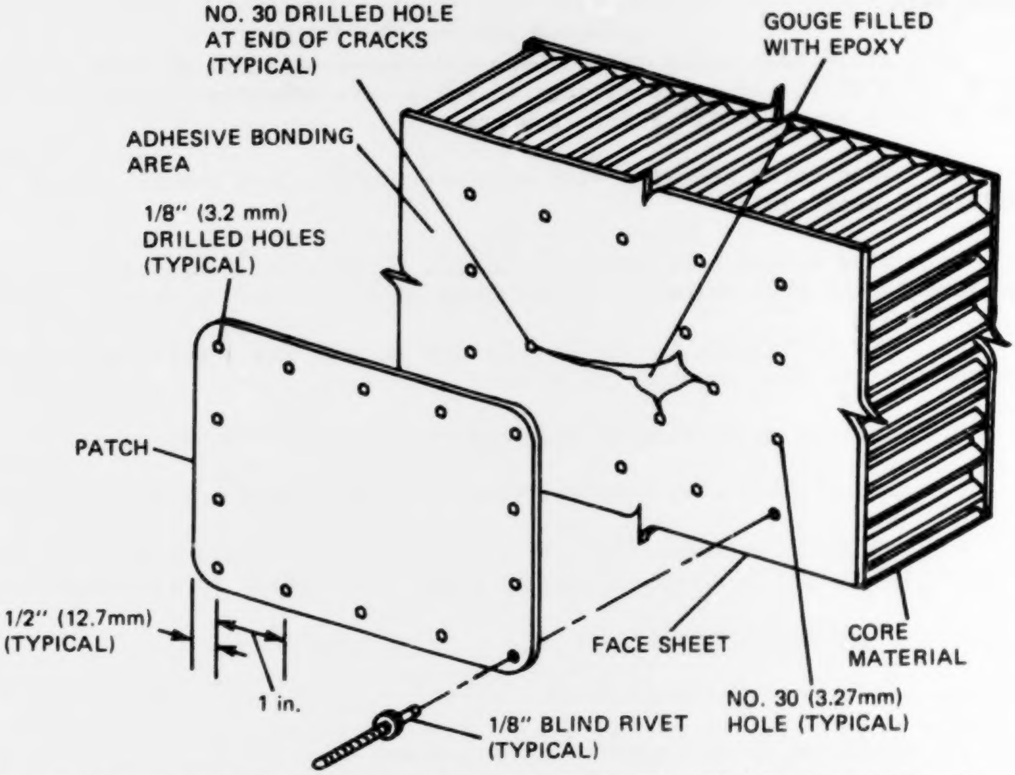


d. Stop-drill all cracks with No. 30 (3.27 mm) drill bit.

e. Center patch over damaged area and mark patch outline on panel skin.

f. Sand all paint from damaged skin within marked area with sandpaper (Item 17, Appendix E).

4-38. (cont)


NO. 30 DRILLED HOLE AT END OF CRACKS (TYPICAL)
GOUGE FILLED WITH EPOXY
ADHESIVE BONDING AREA
1/8" (3.2 mm) DRILLED HOLES (TYPICAL)
PATCH
1/2" (12.7mm) (TYPICAL)
1 in.
FACE SHEET
CORE MATERIAL
NO. 30 (3.27mm) HOLE (TYPICAL)
1/8" BLIND RIVET (TYPICAL)

g. Center patch over damaged area and drill No. 30 diameter holes in panel skin. Use holes in patch as a template.

h. Index patch and panel skin with a mark to allow patch to be replaced in same orientation.

i. Deburr all drill holes.

WARNING

Methylethylketone is flammable and toxic and shall be used only in a well-ventilated area away from all sparks or open flame.

j. Wipe damaged area and patch with a clean cloth (Item 5, Appendix E) dampened in solvent (Item 20, Appendix E) and immediately wipe solvent from surfaces with a clean, dry cloth.

k. Mix sufficient amount of adhesive (Item 1, Appendix E) in accordance with manufacturer's instructions.

4-38. (cont)

l. Pack adhesive in core cells to fill exposed area above surface of panel skin.

m. Apply heat using tripod base heat lamp, Appendix B, item 16, at 200°F (93.3°C) for 40 to 60 minutes to fully cure adhesive. Alternate cures: 150° F for 4 hours or 75° F for 72 hours.

n. Sand cured adhesive with sandpaper to obtain a smooth contour with surface of panel skin.

o. Wipe sanded area and patch with a clean cloth dampened in solvent and immediately wipe solvent from surfaces with a clean, dry cloth.

p. Mix sufficient amount of adhesive in accordance with manufacturer's instructions to coat one side of patch.

q. Apply a thick film of adhesive to mating surface of patch.

r. Place patch over prepared area in same orientation used in step g.

s. Align holes and using hand blind riveter, install 1/8 in. (3.18 mm) diameter blind rivets (Items 15-16, Appendix E). (Refer to paragraph 4-33)

t. Clean repaired surface.

u. Caulk around repair patch. (Refer to paragraph 4-43)

v. Refinish in accordance with paragraph 4-44.

4-39. REPAIR OF PUNCTURE THROUGH ONE SKIN AND CORE.

NOTE

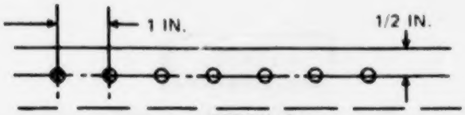
> The following procedure covers repair of panel puncture through one skin with core damage, (damaged area does not exceed 100 square in. (645 sq. cm)).

a. Cut an opening through panel skin with portable electric router, Appendix B, Item 15, that is one inch greater than damaged area. Avoid sharp corners in opening.

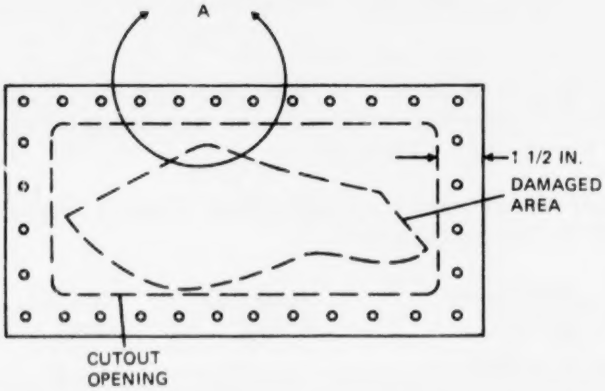
NOTE

> Openings may be oval, circular, square, or rectangular with rounded corners.

4-39. (cont)



DETAIL A



b. Peel damaged portion of skin from core by lifting and rolling skin.

c. Trim core area with a knife to same size as opening while leaving small amount of core material on opposite skin.

d. Cut aluminum patch 1 1/2 inch (3.8 cm) (Item 4, Appendix E) larger all around than cutout opening.

e. Layout and drill 1/8 inch (3.18 mm) diameter holes in patch. (See Detail A.)

f. Cut core material (Items 7-10, Appendix E) same size as cutout opening. Core plug should be flush with or slightly lower than panel skin surface.

g. Center patch over cutout opening and mark patch outline on panel skin.

h. Drill No. 30 diameter holes in panel skin with patch as template.

i. Sand all paint from panel skin within marked area with sandpaper (Item 17, Appendix E).

j. Index patch and panel skin with a mark to allow patch to be replaced with same orientation.

k. Deburr drill holes and sand all paint from panel skin within marked area.

l. Clean loose core material, dust, and chips from cutout opening.

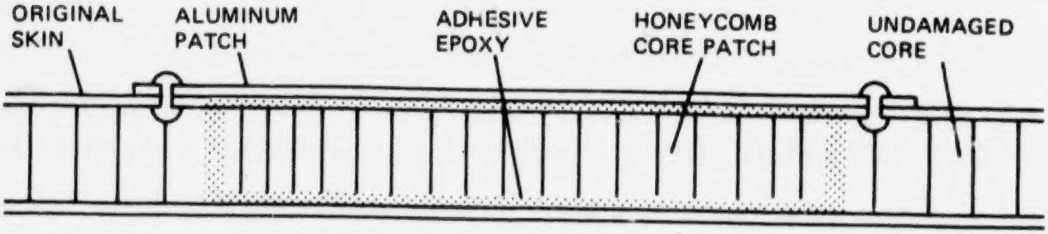
4-39. (cont)

WARNING

Methylethylketone is flammable and toxic and shall be used only in a well-ventilated area away from sparks or open flame. Gloves should be worn during use.

m. Wipe panel skin within marked area and patch with a clean cloth (Item 5, Appendix E) dampened with solvent and immediately wipe solvent from surfaces with a clean, dry cloth.

n. Mix sufficient amount of adhesive (Item 1, Appendix E) in accordance with manufacturer's instructions.



o. Apply an even coat of adhesive to cutout core surfaces.

p. Insert core plug in cutout opening and press firmly in place.

q. Apply an even coat of adhesive around core plug and fill any gaps around plug.

r. Apply heat using tripod base heat lamp, Appendix B, Item 16, at 200°F (93.3°C) for 40 to 60 minutes to fully cure adhesive. Alternate cures: 150° F (65.6°C) for 4 hours or 75° F (23.9°C) for 72 hours.

s. Sand cured adhesive with sandpaper to obtain a smooth contour with surface of panel skin.

t. Apply an even coat of adhesive to mating surface of patch.

u. Place patch over prepared area in same orientation as step j.

v. Align holes and using hand blind riveter, install 1/8 inch (3.18 mm) diameter blind rivets (Items 15-16, Appendix 5). (Refer to paragraph 4-33)

w. Clean repaired surface.

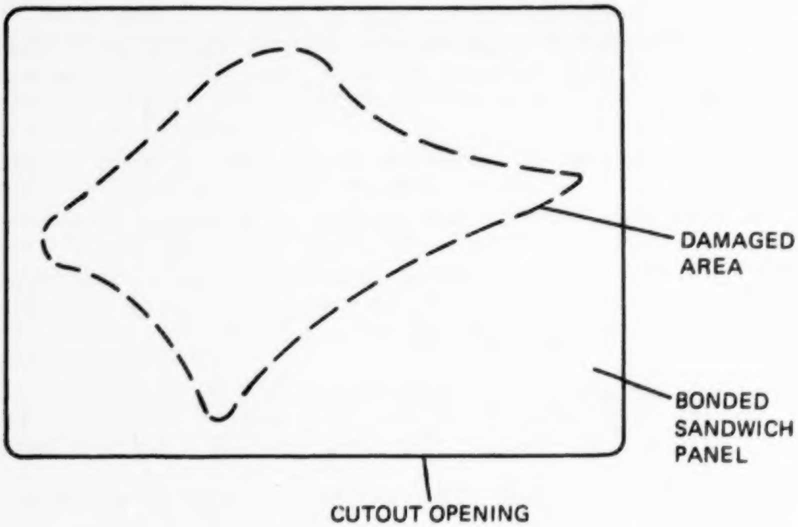
x. Caulk around repair patch. (Refer to paragraph 4-33)

v. Refinish in accordance with paragraph 4-44.

4-40. REPAIR OF PUNCTURE THROUGH BOTH SKINS AND CORE.

NOTE

The following procedures cover repair of panel puncture through both skins and core, (damage area does not exceed 100 square in. (645 sq. cm)). Use hand router to cut patches and openings.



a. Cut an opening through panel skin with portable electric router, Appendix B, Item 15, that is one inch greater than damaged area. Avoid sharp corners in opening.

NOTE

Openings may be oval, circular, square, or rectangular with rounded corners. Ensure core ribbon direction is same as panel. Dry panel per paragraph 4-32, if required.

b. Cut a core plug and two aluminum patches (Item 4, Appendix E) one to three inches larger all around than cutout opening.

c. Mix sufficient amount of adhesive (Item 1, Appendix E) in accordance with manufacturer's instructions to bond two patches to core plug.

4-40. (cont)

WARNING

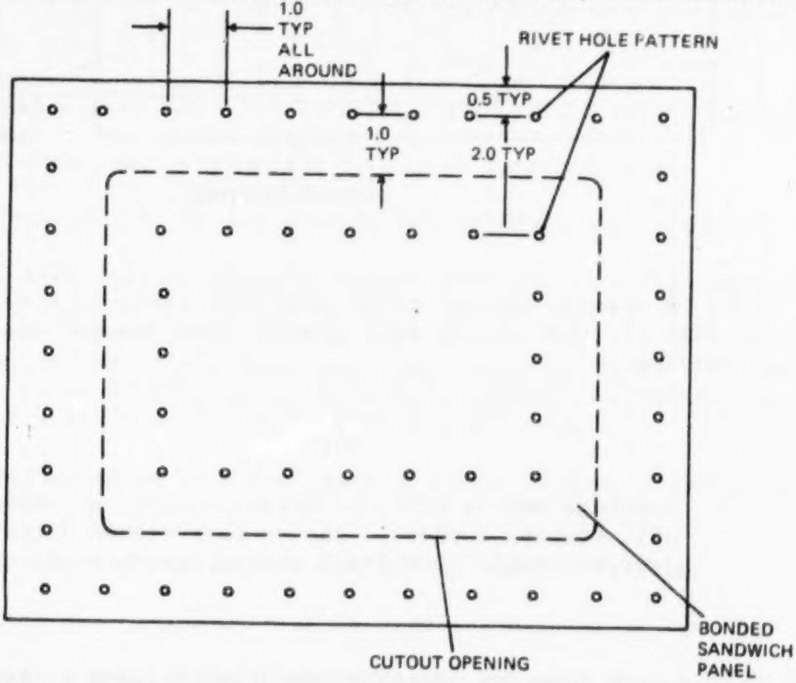
Methylethylketone is flammable and toxic and shall be used only in a well-ventilated area away from sparks or open flame. Gloves should be worn during use.

d. Wipe patches with a clean cloth (Item 5, Appendix E) dampened with solvent and immediately wipe solvent (Item 20, Appendix E) from surfaces with a clean, dry cloth.

e. Apply a thick coat of adhesive to one side of each patch.

f. Place core plug between two patches to create a sandwich panel.

g. Apply pressure and heat using tripod base heat lamp, Appendix B, Item 16, at 200° F (93.9° C) for 40 to 60 minutes to fully cure adhesive.


1.0
TYP
ALL
AROUND
RIVET HOLE PATTERN
0.5 TYP
1.0
TYP
2.0 TYP
CUTOUT OPENING
BONDED
SANDWICH
PANEL

h. Cut bonded sandwich panel to same size as cutout opening (step a). Ensure core ribbon direction is same as panel.

i. Cut two aluminum patches 1 1/2 inch (3.8 cm) larger all around than cutout opening.

4-40. (cont)

j. Layout and drill 1/8 inch (3.18 mm) diameter holes in patches.

k. Position bonded sandwich panel in cutout opening.

l. Center patches, one on each side of panel, over cutout opening.

m. Drill No. 30 (3.27 mm) diameter holes in panel skins and bonded sandwich panel with patches as templates.

n. Mark each patch outline on panel skin, and sand all paint from panel skin within marked area with sandpaper (Item 17, Appendix E).

o. Index each patch and panel skin with a mark to allow patches to be replaced with same orientation.

p. Remove patches and bonded sandwich panel.

q. Deburr drill holes and sand all paint from panel skin within marked areas.

r. Clean loose core material, dust, and chips from cutout opening.

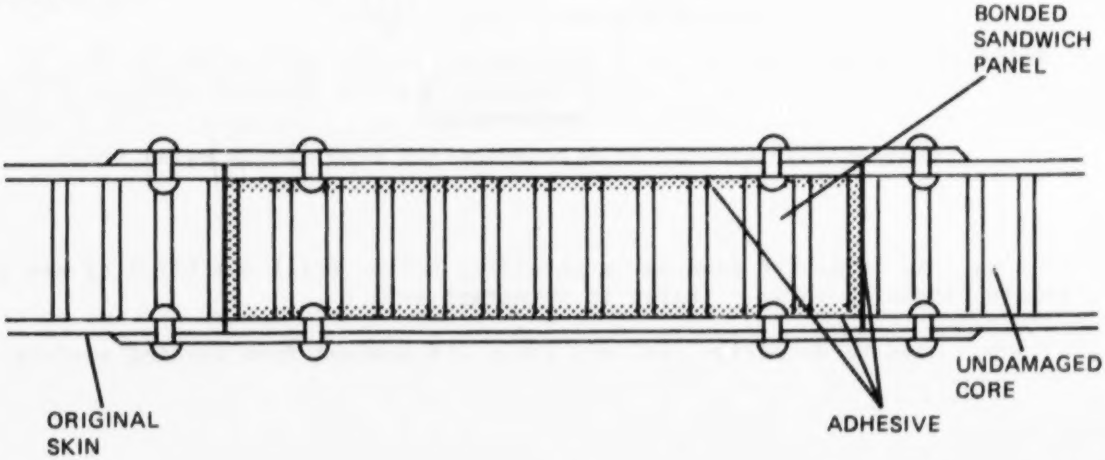
s. Wipe panel skin within marked areas, two patches, and bonded sandwich panel metal skin with a clean cloth dampened with solvent. Immediately wipe solvent from surfaces with a clean, dry cloth.

t. Mix sufficient amount of adhesive in accordance with manufacturer's instructions.

u. Apply a thick coat of adhesive to inside surfaces of panel cutout opening, bonded sandwich panel, and two patches.

v. Position bonded sandwich panel in cutout opening.

w. Fill any gaps between cutout opening and bonded sandwich panel with adhesive.



4-40. (cont)

x. Place patches over prepared areas in same orientation as step o.

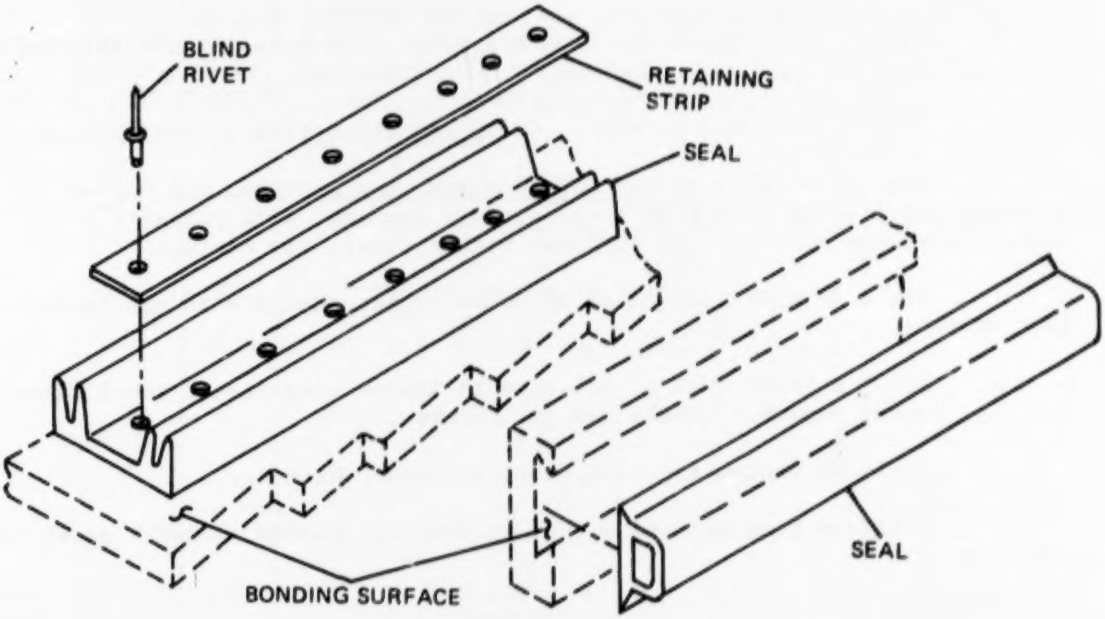
y. Align holes and using hand blind riveter, install 1/8 inch (3.18 mm) diameter blind rivets (Items 15-16, Appendix E). (Refer to paragraph 4-33)

z. Clean repaired surfaces.

aa. Caulk around repair patches. (Refer to paragraph 4-43)

ab. Refinish in accordance with paragraph 4-44.

4-41. SHELTER BODY SEALS REPLACEMENT



WARNING

Wear safety gogles for eye protection from flying metal chips.

a. If defective seal has a retaining strip, drill out blind rivets and remove retaining strip. (Refer to paragraph 4-33)

b. Remove defective seal and strip old sealant from bonding surface.

4-41. (cont)

WARNING

Methylethylketone is flammable and toxic and shall be used only in a well-ventilated area away from all sparks or open flame.

c. Sand using sandpaper (Item 17, Appendix E) only if required to remove material not taken off in preceding step.

d. Wipe bonding surface with a clean cloth (Item 5, Appendix E) dampened with solvent (Item 20, Appendix E) and immediately wipe solvent from surface with a clean, dry cloth.

CAUTION

Seals shall not be washed with any aromatic hydrocarbon (such as benzene, toluene, or xylene) which will cause deterioration.

e. Clean seal with a lint-free cloth by dry wiping prior to bonding.

f. Brush sealant (Item 18, Appendix E) on mating surfaces of seal and bonding surface.

g. When sealant is tacky (approximately 5 minutes), place seal in position, press firmly to seat and ensure contact with mating surface.

h. If seal is the type that has a retaining strip, seal shall be bonded prior to riveting retaining strip. (Refer to paragraph 4-33 for blind rivet installation.)

i. After installing rivets, using hand blind riveter, cover rivets and seal with sealing compound (Item 19, Appendix E).

4-42. THREADED INSERTS REPLACEMENT.

NOTE

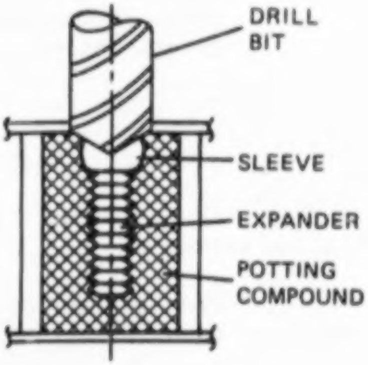
Inserts installed in extrusions are not potted. For removal of these inserts, perform steps a and b only. Knock out insert and replace with same type.

a. Depending on insert size, select a drill bit in size range listed below.

Insert Thread Size	Drill Size Range inches (mm)
10-32	7/16-15/32 (11/12.4)
1/4-28	17/32-21/32 (13.5/16/7)
5/16-24	39/64-21/32 (15.5/16.7)
3/8-24	43/64-23/32 (17/18.3)

WARNING

Wear safety goggles for eye protection against flying chips.



b. Using selected drill bit, drill head flange from insert.

c. Drill small holes around insert body in potting compound to approximate depth of insert. Take care not to damage area around insert beyond hole diameter of step above. Do not drill through to opposite skin.

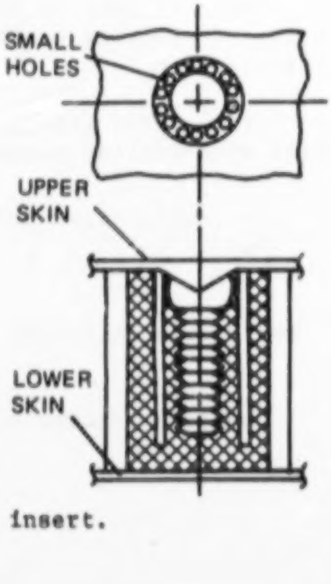
d. Install bolt of corresponding thread size in insert.

e. Use wrench to break insert loose.

f. Install bolt end in a hand drill motor.

g. Spin loose insert to build up heat which will allow insert to be removed from hole.

h. Remove loose chips and clean out hole.



NOTE

Replacement insert is a spool type potted insert.

4-42. (cont)

i. Depending on replacement insert size, select a drill bit from sizes listed below. After drilling small holes around periphery of insert, the remaining hole will be much larger than the recommended drill size.

Insert Thread Size	Insert Outside Diameter inches (mm)	Drill Size inches (mm)
1/4-28	0.437 (11.1)	29/64 ± 0.010 (11.5 ± 0.25)
5/16-24	0.500 (12.7)	33/64 ± 0.010 (13.1 ± 0.25)
10-32 & 3/8-16	0.562 (14.3)	37/64 ± 0.010 (14.7 ± 0.25)
1/4-28 & 5/16-24	0.687 (17.5)	45/64 ± 0.010 (17.9 ± 0.25)
3/8-24	0.750 (19.1)	49/64 ± 0.010 (19.5 ± 0.25)

j. Using selected drill bit, drill through panel skin to approximate depth of insert to be installed.

NOTE

Take care not to drill through opposite skin.

k. Install long end of Allen wrench into drill chuck and insert short end in predrilled hole and remove additional honeycomb core to one inch (2.54 mm) in diameter. Leave from 1/8 in. (3.2 mm) to 1/4 in. (6.4 mm) of core at bottom of hole.

l. Remove loose honeycomb and foam insulation, if applicable, from hole.

m. Degrease insert by cleaning with solvent (Item 20, Appendix E).

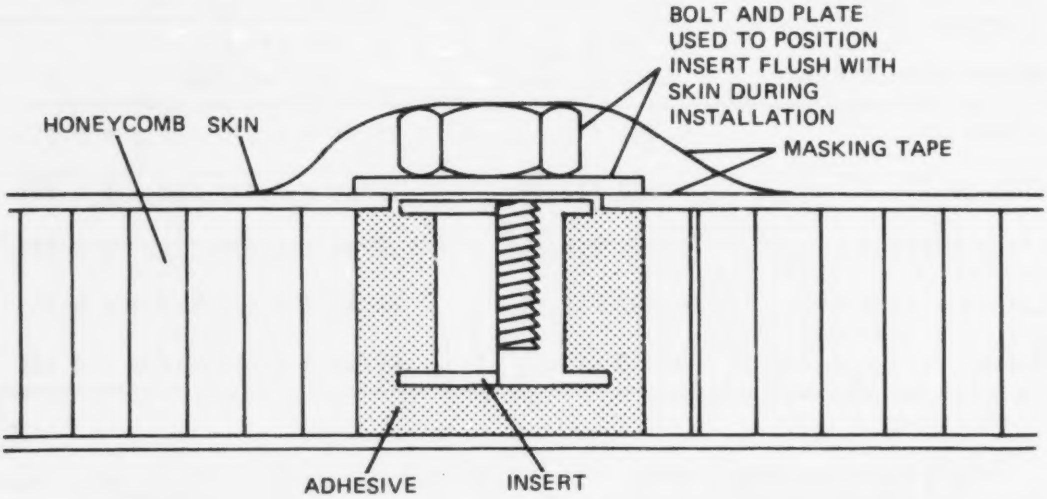
NOTE

After cleaning, handle insert with clean, white gloves (Item 11, Appendix E).

n. Mask skin area around hole with masking tape (Item 22, Appendix E) approximately 3" x 3".

4-42. (cont)

o. Prepare aluminum plate (Item 24, Appendix E) approximately 1/8 in. (3.2 mm) thick by 2 in. (50.8 mm) square with a center hole equal to bolt thread outer diameter (replacement insert thread size).


BOLT AND PLATE USED TO POSITION INSERT FLUSH WITH SKIN DURING INSTALLATION
HONEYCOMB
SKIN
MASKING TAPE
ADHESIVE
INSERT

p. Install bolt through plate and into insert. Hand-tighten insert against plate.

q. Mix sufficient amount of adhesive (Item 1, Appendix E) in accordance with manufacturer's instructions.

r. Fill prepared hole completely with mixed adhesive. Make sure there are no air pockets.

s. Force preassembled insert into filled hole with a threading motion until plate is flush against skin.

t. Clean excess adhesive (squeeze out) from work area.

u. Apply masking tape over bolt to maintain alignment during curing cycle.

v. Cure non-structural inserts for at least 4 hours at 75° F.

w. Inserts on which there is structural dependency should be cured at 75° F for 72 hours.

x. After cure, remove masking tape, bolt, and plate.

y. Clean skin as required.

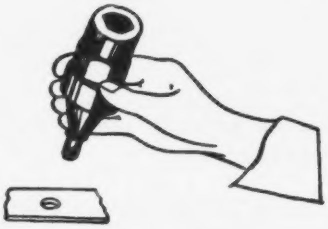
z. Refinish in accordance with paragraph 4-44.

4-42. (cont)

aa. Non-Potted Insert Manual Installation

(1) Select fastener header model, Appendix B, Item 7 or 8, applicable to insert to be installed.

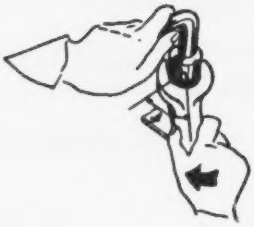
(2) Lubricate header jackscrew threads with spray lubricant, Appendix E, Item 25.



(3) Assemble sleeve and expander or one-piece insert on header pull-up stud to engage all threads on stud.

(4) Advance header anvil until it is tight on head of sleeve or one-piece insert.

(5) Position prepared assembly in hole.



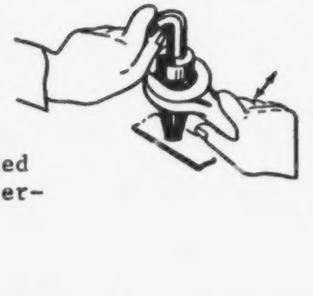
(6) Place hex wrench (supplied with header) in socket of header jackscrew and place box-end or adjustable wrench, Appendix B, Item 11, on hex nut approximately 60° rotation from line of hex wrench.

NOTE

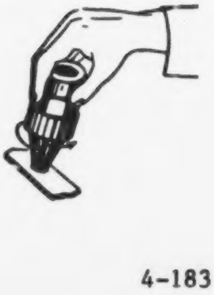
A box-end ratchet wrench is preferable as the pull on the expander or one-piece insert body should be made at a uniform rate and as quickly as possible.

(7) Hold header perpendicular to plane of work. Hold jackscrew stationary with hex wrench. Turn hex nut in clockwise direction through 60° angle and repeat until firm resistance indicates complete upset of sleeve or one-piece insert body. Approximate number of turns required to upset is as follows:

Thread Size	Turns (Min Grip)	Turns (Max Grip)
10-32	1-3/4	1
1/4-28	2-1/4	1-1/2
5/16-24	2-3/4	1-3/4
3/8-24	2-1/4	1-1/2



(8) Break hex nut loose with counterclockwise rotation. Remove both wrenches from header.



(9) Remove header from installed insert by rotating entire header in counterclockwise direction.

4-43. CAULKING REPAIRED AREAS.

a. Mix sufficient amount of sealing compound (Item 19, Appendix E) in accordance with manufacturer's instructions.

NOTE

Maximum application life of sealing compound is 2 hours.

b. Just prior to application of sealing compound, clean surface to be sealed with cloth (Item 5, Appendix E) dampened with solvent (Item 20, Appendix E).

c. Dry with a clean cloth before solvent evaporates in order to prevent contamination.

d. Apply sealing compound with caulking gun (or spatula) in 1/8 inch (3.18 mm) minimum fillets.

e. Nominal curing time is 72 hours at 75° F.

4-44. PAINT REFINISHING.

PAINT DATA

Use	Type	Specification Color	Color Code FED STD 595
Interior Paint	Coating, Urethane Aliphatic Isocyanate	MIL-C-83286 Gloss White	17925
Exterior Paint	Coating, Aliphatic Polyurethane	MIL-C-46168 Sand	
Primer	Primer Coating, Epoxy Polyamide	MIL-P-23377	
Floor Primer	Primer, Zinc Chromate	TT-P-1757	
Floor Paint	Walkway Compound	MIL-W-5044 Type I Gray	26251

4-44. (cont)

NOTE

Paint data is also listed on color code identification plate on personnel endwall.

a. Prepare surface for painting by removing all corrosion by wire brushing, sanding, or application of corrosion-removing compounds.

b. Chemically treat all aluminum parts in accordance with MIL-C-5541, Class 1A.

c. Areas to be painted shall be free of dust, residue, and cleaning compounds before refinishing.

d. Solvent, primer, or paint shall not be applied to seals or non-metal parts. Mask such parts with masking tape for protection.

e. Mix and apply epoxy polyamide primer coating in accordance with MIL-C-22751.

f. Allow to dry thoroughly before applying finish coat.

g. Mix and apply paint in accordance with manufacturer's instructions.

h. Apply two separate, uniform coats. Make sure there are no sags or runs.

i. Allow first coat to dry before applying second coat.

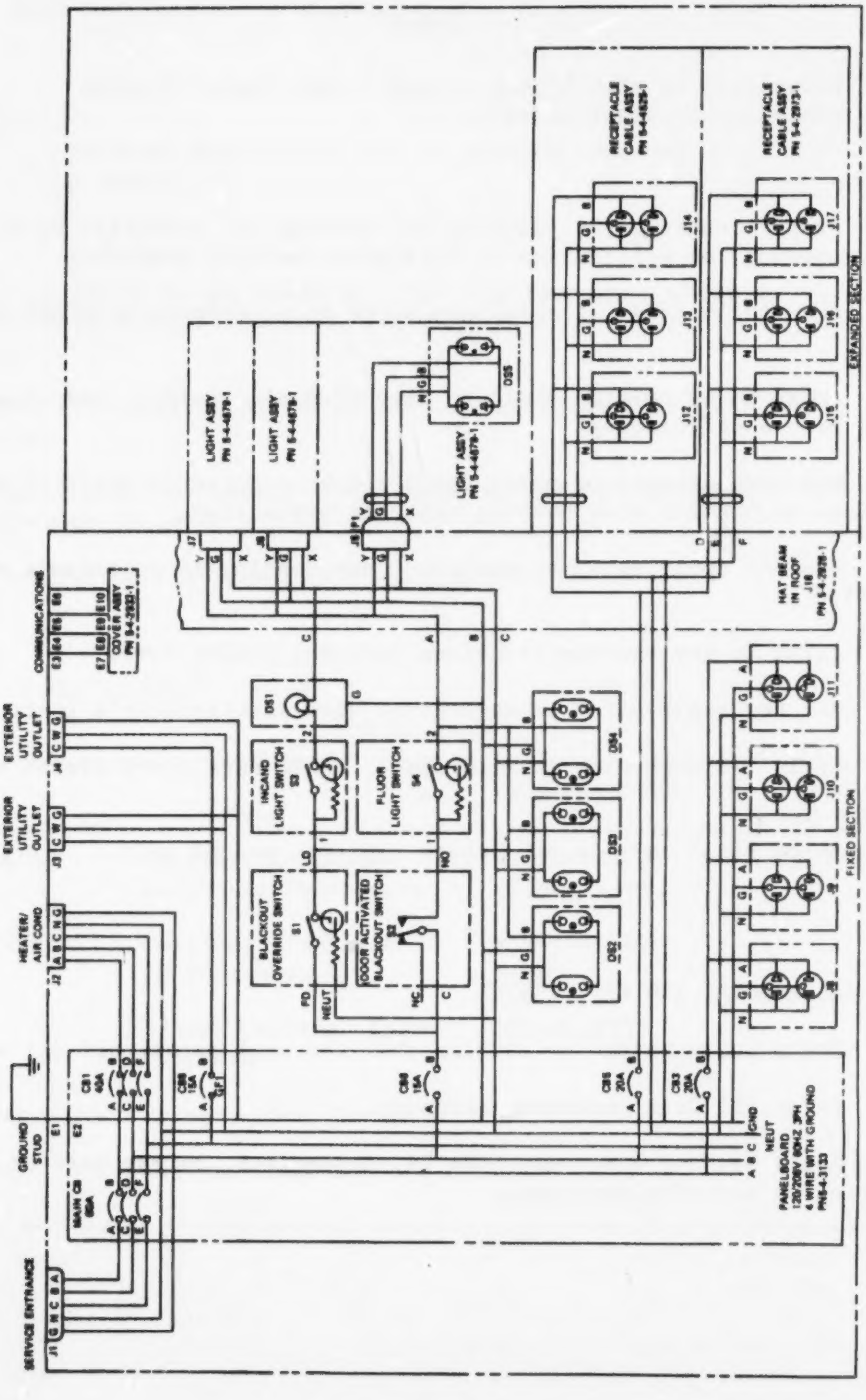
4-45. DECAL REMOVAL AND REPLACEMENT

a. Use a putty knife (or similar tool) to peel decals off all surfaces.

b. Clean all decal mounting surfaces.

c. Apply sealing compound, Item 19, Appendix E, to the rear of decals and position on mounting surfaces.

4-46. ELECTRICAL SYSTEM SCHEMATIC DIAGRAM


SERVICE ENTRANCE
J1
MAIN CB 60A
GROUND STUD
E1
E2
CB1 40A
CB6 15A
GFI
CB4 15A
CB5 20A
CB3 20A
PANELBOARD 120/208V 60HZ 3PH 4 WIRE WITH GROUND PN5-4-3133
GND
NEUT
HEATER/ AIR COND
J2
EXTERIOR UTILITY OUTLET
J3
J4
COMMUNICATIONS
COVER ASSY
BLACKOUT OVERRIDE SWITCH S1
DOOR ACTIVATED BLACKOUT SWITCH S2
INCAND LIGHT SWITCH S3
FLUOR LIGHT SWITCH S4
DS1
DS2
DS3
DS4
DS5
LIGHT ASSY PN 5-4-4879-1
LIGHT ASSY PN 5-4-4879-1
LIGHT ASSY PN 5-4-4879-1
J7
J8
J5
P1
HAT BEAM IN ROOF J18
RECEPTACLE CABLE ASSY
RECEPTACLE CABLE ASSY
J8
J9
J10
J11
J12
J13
J14
J15
J16
J17
EXPANDED SECTION
FIXED SECTION

4-47. WIRE LIST

Wire No	Inch Long	Size Awg And Color	From	To
W1-1	8	12 RED	CB6-B	S1-FD
W1-2	202	12 RED	CB6-B	S2-C
W1-3	8	12 RED	S1-LD	S3-1
W1-4	202	12 RED	S2-NO	S1-LD
W1-5	37	12 RED	S2-NO	S4-1
W1-6	202	12 RED	S3-2	DS1
W1-7	215	12 RED	S4-2	DS2-B
W1-8	116	12 RED	DS2-B	DS3-B
W1-9	116	12 RED	DS3-B	DS4-B
W1-10	30	12 RED	DS4-B	J18-A
W1-11	22	12 RED	J18-A	J5-Y
W1-12	61	12 RED	J18-A	J6-Y
W1-13	130	12 RED	J18-A	J7-Y
W1-14	48	12 BLK	P1-Y	DS5-B
W1-15	54	12 WHT	J18-C	NEUT
W1-16	150	12 WHT	J18-C	DS1
W1-17	86	12 WHT	J18-C	DS2-N
W1-18	42	12 WHT	J18-C	J7-X
W1-19	105	12 WHT	J18-C	J6-X
W1-20	116	12 WHT	DS2-N	DS3-N
W1-21	116	12 WHT	DS3-N	DS4-N
W1-22	42	12 WHT	DS4-N	J5-X
W1-23	48	12 WHT	P1-X	DS5-N
W1-24	54	12 GRN	J18-B	GND
W1-25	150	12 GRN	J18-B	DS1-G
W1-26	80	12 GRN	J18-B	DS2-G
W1-27	28	12 GRN	J18-B	J7-G
W1-28	100	12 GRN	J18-B	J6-G
W1-29	116	12 GRN	DS2-G	DS3-G
W1-30	116	12 GRN	DS3-G	DS4-G
W1-31	42	12 GRN	DS4-G	J5-G
W1-32	48	12 GRN	P1-G	DS5-G
W1-33	12	12 RED	E3	E7
W1-34	12	12 RED	E4	E8
W1-35	12	12 RED	E5	E9
W1-36	12	12 RED	E6	E10
W1-37	20	12 BLU	CB8-B	J3-C
W1-38	20	12 BLU	CB8-B	J4-C
W1-39	20	12 WHT	J3-W	NEUT
W1-40	20	12 WHT	J4-W	NEUT
W1-41	20	12 GRN	J3-G	GND
W1-42	20	12 GRN	J4-G	GND
W1-43	10	12 WHT	S1-NEUT	NEUT
W1-44	10	12 BARE	S2-GND	DS1-BOX GND
W1-45	24	12 GRN	DS1-G	S3-BOX GND
W2-1	167	12 BLK	CB3-B	J8-A
W2-6	64	12 WHT	J8-N	J9-N
W2-7	85	12 WHT	J9-N	J10-N

4-47. (cont)

Wire No	Inch Long	Size Awg And Color	From	To
W2-8	64	12 WHT	J10-N	J11-N
W2-9	167	12 GRN	J8-G	GND
W2-10	64	12 GRN	J8-G	J9G
W2-11	6	12 BARE	J8-G	BOX GND
W2-12	85	12 GRN	J9-G	J10-G
W2-13	6	12 BARE	J9-G	BOX GND
W2-14	64	12 GRN	J10-G	J11-G
W2-15	6	12 BARE	J10-G	BOX GND
W2-16	6	12 BARE	J11-G	BOX GND
W2-17	48	12 BLK	CB5-B	J12-B
W2-18	111	12 BLK	J12-B	J13-B
W2-19	61	12 BLK	J13-B	J14-B
W2-20	250	12 RED	CB5-B	J18-B
W2-21	48	12 BLK	J18-D	J15-B
W2-22	111	12 BLK	J15-D	J16-B
W2-23	61	12 BLK	J16-D	J17-B
W2-24	48	12 WHT	J12-N	NEUT
W2-25	111	12 WHT	J12-N	J13-N
W2-26	61	12 WHT	J13-N	J14-N
W2-27	250	12 WHT	J18-E	NEUT
W2-28	48	12 WHT	J18-E	J15-N
W2-29	111	12 WHT	J15-N	J16-N
W2-30	61	12 WHT	J16-N	J17-N
W2-31	48	12 GRN	J12-G	GND
W2-32	111	12 GRN	J12-G	J13-G
W2-33	6	12 BARE	J12-G	BOX GND
W2-34	61	12 BRN	J13-G	J14-G
W2-35	6	12 BARE	J13-G	BOX GND
W2-36	6	12 BARE	J14-G	BOX GND
W2-37	250	12 GRN	J18-F	GND
W2-38	48	12 GRN	J18-F	J15-G
W2-39	6	12 BARE	J18-F	BOX GND
W2-40	111	12 GRN	J15-G	J16-G
W2-41	6	12 BARE	J15-G	BOX GND
W2-42	61	12 BRN	J16-G	J17-G
W2-43	6	12 BARE	J16-G	BOX GND
W2-44	6	12 BARE	J17-G	BOX GND
W3-1	36	4 BLK	J1-A	MAIN CB-A
W3-2	36	4 RED	J1-B	MAIN CB-C
W3-3	36	4 BLU	J1-C	MAIN CB-E
W3-4	36	4 WHT	J1-N	NEUT
W3-5	36	6 GRN	J1-G	GND
W3-6	36	6 GRN	E1	E2
W4-1	36	4 BLK	J2-A	CB1-B
W4-2	36	4 RED	J2-B	CB1-D
W4-3	36	4 BLU	J2-C	CB1-F
W4-4	36	4 WHT	J2-N	NEUT
W4-5	36	6 GRN	J2-G	GND

Section IV. PREPARATION FOR STORAGE AND SHIPMENT

4-48. PREPARATION FOR STORAGE AND SHIPMENT. The following steps describe procedures for storing or shipping the shelter.

a. Inspection. Inspect the shelter for the following:

(1) Make sure all circuit breakers and switches in OFF position.

(2) Make sure circuit breaker panel door is closed.

(3) Make sure equipment container is strapped down to shelter floor.

(4) Make sure caps are secured on power entry panel receptacles and binding posts are tightened.

(5) Make sure the stop plate in the load balancer is in the down position and secured with the pin.

(6) Make sure all lights and jacks are secured in their stowage positions.

(7) Make sure the foot bolt and chain bolt are secured.

(8) Make sure the receptacle outlets are stowed and the roof struts are secured.

(9) Make sure all doors are securely closed.

(10) Make sure camlock pin is engaged in hole or corner post.

b. Packing. Be sure all components are clean and dry before packing.

CAUTION

Use care when transporting or storing shelter to prevent damage to shelter.

c. Care and Storage. Store shelter in a dry area or a designated supply facility. If stored outside in humid conditions, check quarterly for dampness inside the shelter.

CHAPTER 5

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

5-1. GENERAL. This chapter provides maintenance procedures for direct support personnel and consists of the following:

a. Circuit breaker panel assembly replacement and repair (paragraph 5-2).

b. Power entry panel assembly replacement and repair (paragraph 5-3).

c. Roof panel replacement (paragraph 5-4).

d. Corner post and ISO fitting assembly replacement and repair (paragraph 5-5).

5-2. CIRCUIT BREAKER PANEL ASSEMBLY REPLACEMENT AND REPAIR

This task covers:

- a. Removal
- b. Disassembly
- c. Cleaning, Inspection
- d. Repair
- e. Assembly
- f. Installation

INITIAL SETUP

Standard Tools
General mechanics tool kit

Personnel
Electrician

REMOVAL

1. Disconnect site power.

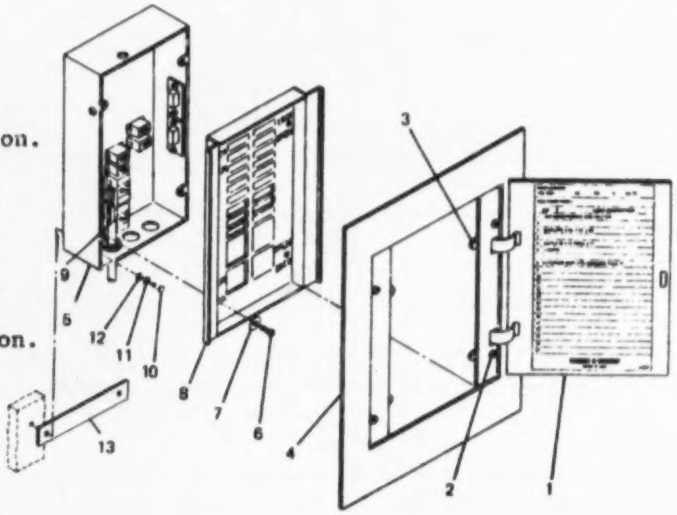
2. Set all circuit breakers and switches to OFF position.

3. Open circuit breaker panel door (1).

4. Loosen four captive screws (2) and move four clamp fingers (3) to OPEN position.

5. Lift circuit breaker panel cover (4) from circuit breaker box (5).

6. Remove four screws (6) and washers (7) and lift panelboard (8) from circuit breaker box (5).



5-2. (cont)

7. Disconnect wires (9) from circuit breakers and switches.

NOTE

Tag all wires for reconnection.

8. Remove screws (10), lockwashers (11), and washers (12), and separate circuit breaker panel assembly (5) and spacer (13) from personnel door end endwall panel.

DISASSEMBLY

1. Open circuit breaker panel door (1).

2. Loosen four captive screws (2) and move four clamp fingers (3) to OPEN position.

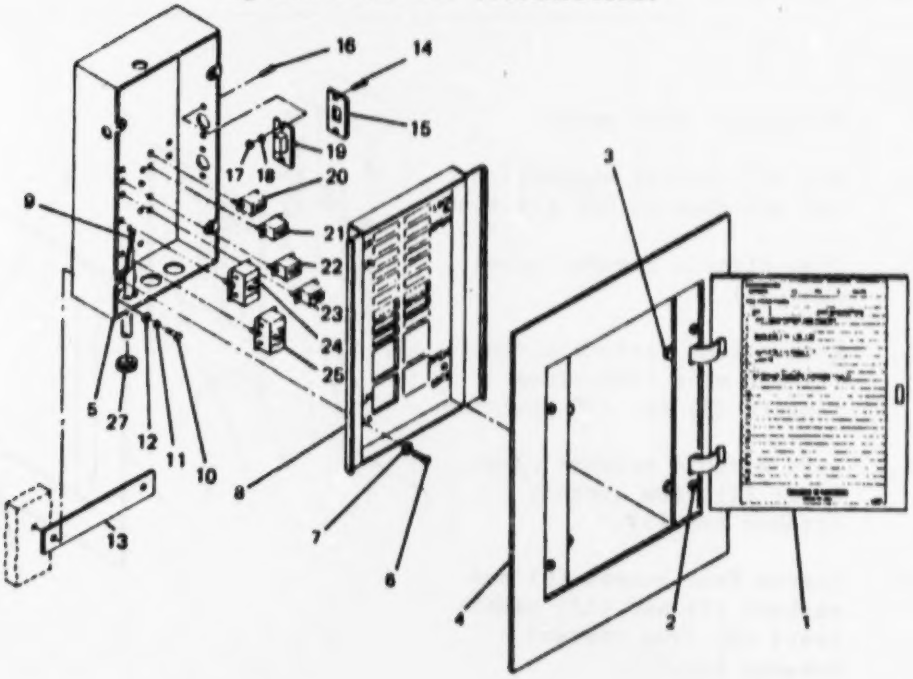
3. Lift circuit breaker panel cover (4) from circuit breaker box (5).

4. Remove four screws (6) and washers (7) and lift panelboard (8) from circuit breaker box (5).

5. Disconnect wires (9) from light switches (19) and circuit breakers (20 through 26).

NOTE

Tag all wires for reconnection.



5-2. (cont)

6. Remove four screws (14) and two switch covers (15).

7. Remove four screws (16), nuts (17), and lockwashers (18), and remove two light switches (19) from circuit breaker box (5).

8. Remove circuit breakers (20 through 25) from circuit breaker box (5).

9. Remove grommets (27) from circuit breaker box (5).

CLEANING, INSPECTION

1. Clean circuit breaker panel and components surfaces:

2. Inspect mounting surfaces for corrosion and damage.

3. Inspect for and replace if necessary:
   a. Missing or damaged components
   b. Corrosion or paint damage.

REPAIR

Repair corrosion or paint damage. (Refer to paragraph 4-44)

ASSEMBLY

1. Install grommets (27) in circuit breaker box (5).

2. Install circuit breakers (20 through 25) in circuit breaker box (5).

3. Connect wires (9) to circuit breakers (20 through 25). (Refer to paragraph 4-47)

4. Position two light switches (19) in circuit breaker box (5) and secure with four screws (16), nuts (17), and lockwashers (18).

5. Position two switch covers (15) over light switches (19) and secure with four screws (14).

6. Connect wires (9) to light switches (19). (Refer to paragraph 4-47)

7. Position panelboard (8) over circuit breakers (20 through 26) in circuit breaker box (5) and secure with four screws (6) and washers (7).

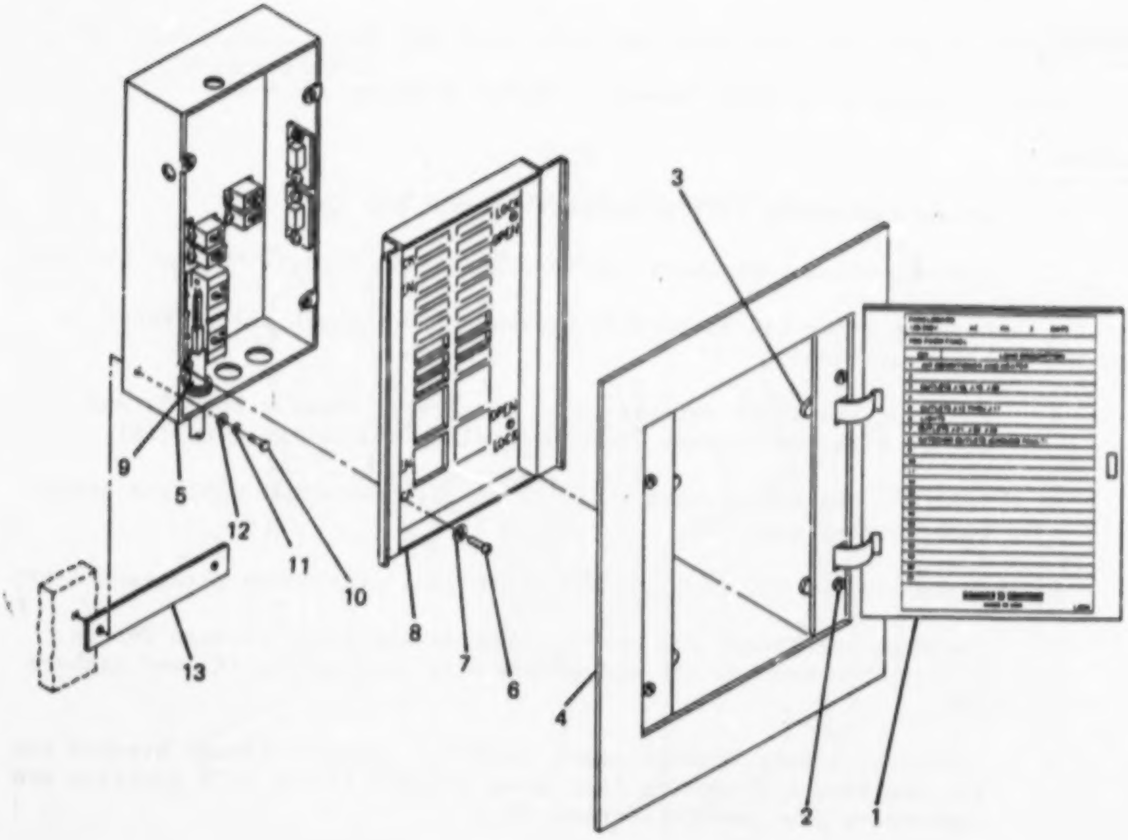
8. Position circuit breaker panel cover (4) against circuit breaker box (5) and secure by moving four clamp fingers (3) to LOCK position and tightening four captive screws (2).

9. Close circuit breaker panel door (1).

5-2. (cont)

INSTALLATION

1. Position spacer (13) and circuit breaker panel box (5) against personnel door end endwall panel and secure with screws (10), lockwashers (11), and washers (12).
2. Connect wires (9) to light switches and circuit breakers. (Refer to paragraph 4-47)
3. Position panelboard (8) over circuit breakers in circuit breaker box (5) and secure with four screws (6) and washers (7).
4. Position circuit breaker panel cover (4) against circuit breaker box (5) and secure by moving four clamp fingers (3) to lock position and tightening four captive screws (2).
5. Close circuit breaker panel door (1).



5-3. POWER ENTRY PANEL ASSEMBLY REPLACEMENT AND REPAIR

This task covers:

a. Removal
b. Disassembly
c. Cleaning, Inspection
d. Repair
e. Assembly
f. Installation

INITIAL SETUP

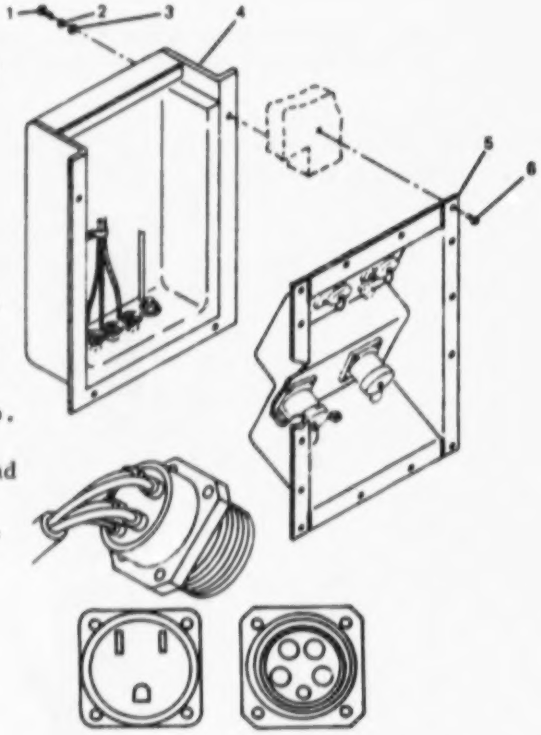
Special Tools
Hand blind riveter, Appendix B, Item 2
Crimping tool, Appendix B, Item 12

Standard Tools
General mechanics tool kit

Personnel
Electrician

WARNING

Disconnect all power sources from power entry panel assembly before removing.



REMOVAL

1. Inside shelter, remove screws (1), lockwashers (2), and washers (3), and carefully lift cover assembly (4) away from personnel door end endwall panel as far as it will go.

2. Disconnect wires at receptacles and terminals/connectors from back of power entry panel assembly (5).

NOTE

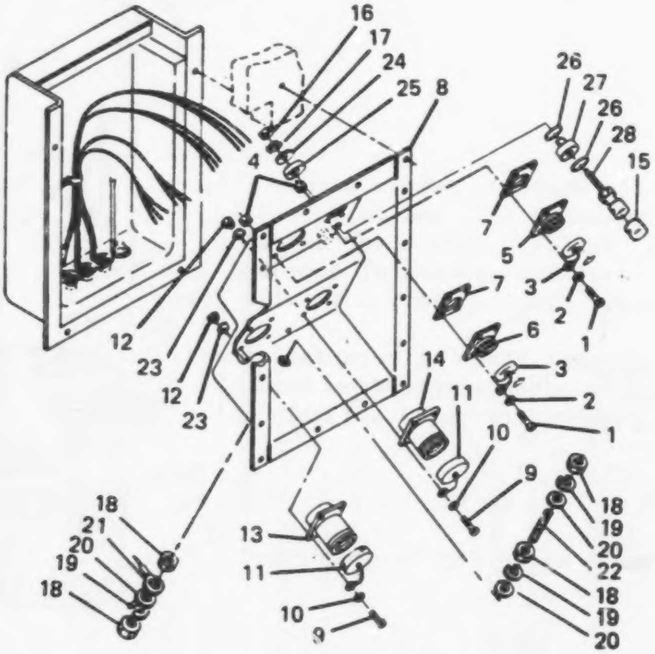
Tag all wires for reconnection

3. Outside shelter, drill out rivets (6) and remove power entry panel assembly (5) from personnel door end endwall panel. (Refer to paragraph 4-33)

5-3. (cont)

DISASSEMBLY

1. Remove screws (1), lockwashers (2), receptacle covers (3), and nuts (4).
2. Remove receptacles (5 and 6) and gaskets (7) from panel (8).
3. Remove screws (9), lockwashers (10), receptacle covers (11), nuts (12), and washers (23).
4. Remove receptacles (13 and 14) from panel (8).
5. Remove rubber cap (15), nut (16), lockwasher (17) brass washer (24), nylon washer (25), two O-rings (26), nylon washer (27), and binding post body (28) from panel (8).
6. Remove four nuts (18), three lockwashers (19), three washers (20), terminal lug (21), and threaded stud (22) from panel (8).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22
18
19
20

CLEANING, INSPECTION

1. Clean power entry panel and component surfaces.
2. Inspect mounting surfaces for corrosion and damage.

5-3. (cont)

3. Inspect for and replace if necessary:

   a. Missing or damaged components.

   b. Corrosion or paint damage.

REPAIR

Repair corrosion or paint damage. (Refer to paragraph 4-44)

ASSEMBLY

1. Install threaded stud (22), terminal lug (21), three washers (20), three lockwashers (19), and four nuts (18) in panel (8).

2. Install binding post body (28), nylon washer (27), two O-rings (26), nylon washer (25), brass washer (24), lockwasher (17), nut (16), and rubber cap (15) in panel (8).

3. Using crimping tool, attach wires to receptacle pins. (Refer to paragraph 4-47)

4. Install receptacles (13 and 14) in panel (8) and secure with screws (9), lockwashers (10), receptacle covers (11), washers (23), and nuts (12).

5. Install receptacles (5 and 6) and gaskets (7) in panel (8) and secure with screws (1), lockwashers (2), receptacle covers (3), and nuts (4).

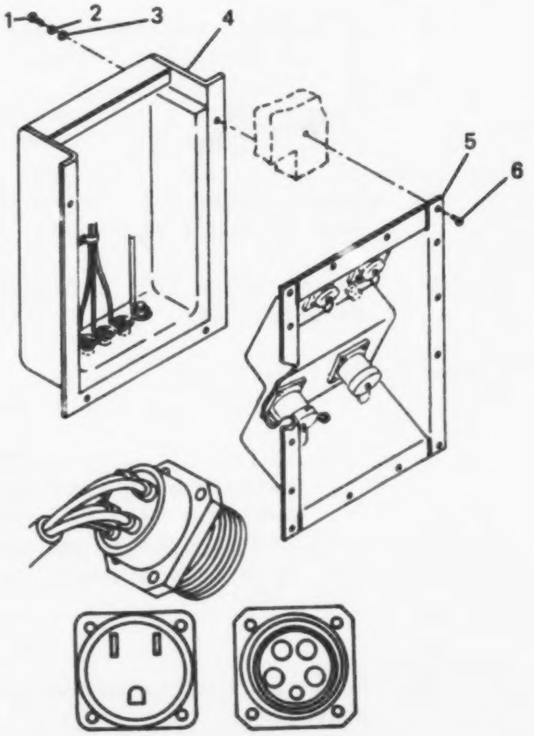
INSTALLATION

1. Position power entry panel assembly (5) against outside of personnel door end endwall panel and secure with rivets (6). (Refer to paragraph 4-33)

2. Connect wires to receptacles and terminals/connectors at rear of power entry panel assembly (5). (Refer to paragraph 4-47)

3. Position cover assembly against inside of personnel door end endwall panel and secure with screws (1), lockwashers (2), and washers (3).

4. Reconnect electrical power to service entrance receptacle.



5-4. ROOF PANEL REPLACEMENT

This task covers:
- a. Removal
- b. Installation

INITIAL SETUP

Special Tools
Top lifting container lift sling, Appendix D

Standard Tools
General mechanics tool kit

Personnel - 6
1 Electrician

Materials
Sealing compound, Item 19, Appendix E
Solvent, Item 20, Appendix E

REMOVAL

1. Disconnect site power.

2. Remove receptacle outlets. (Refer to paragraph 4-13)

3. Set main circuit breaker and circuit breaker CB6 to off position.

4. Remove hinged roof. (Refer to paragraph 4-20)

5. Remove fixed roof area ceiling lights. (Refer to paragraph 4-12)

6. Disconnect and remove all wires from fixed roof beam. Tag all wires for reconnection. (Refer to paragraph 4-16)

7. Remove bolts (1), lockwashers (2), and washers (3) securing fixed roof to upper ISO fittings (4).

8. Remove bolts (5), lockwashers (6), and washers (7) securing fixed roof to fixed personnel endwall and sidewall.

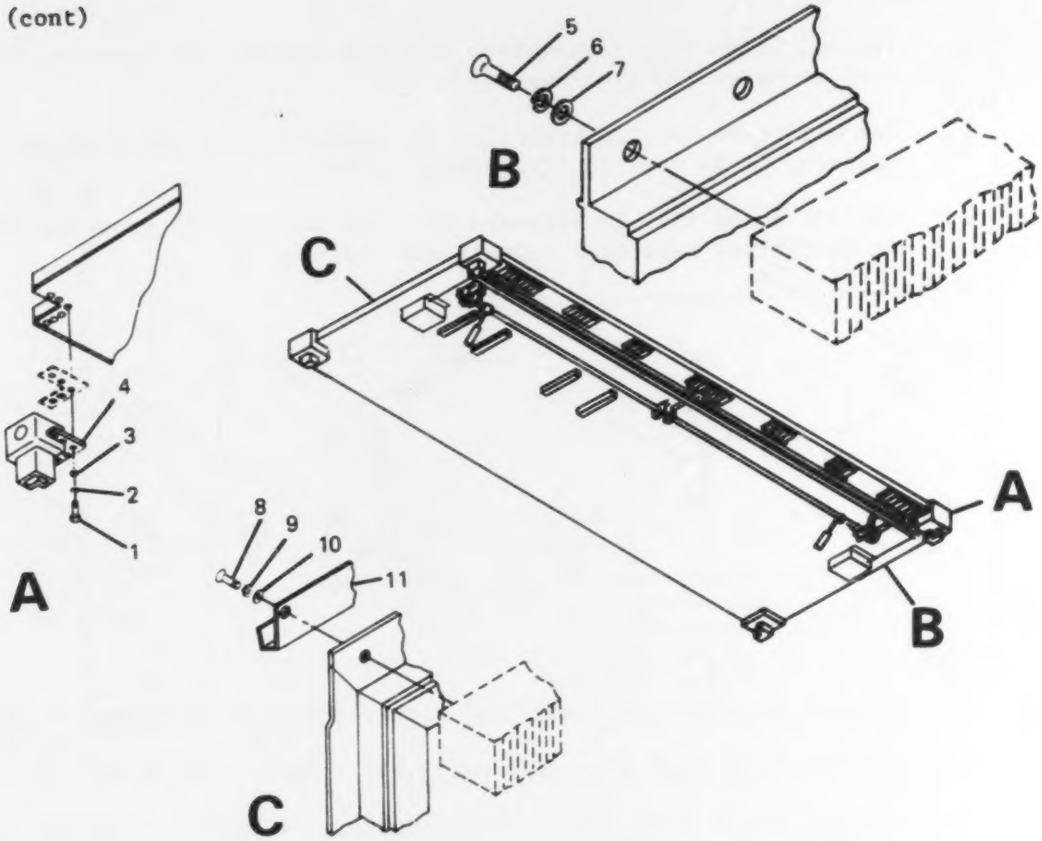
9. Remove bolts (8), lockwashers (9), washers (10) and drip cap (11) securing fixed roof to fixed cargo endwall.

WARNING

Methylethylketone is flammable and toxic and shall be used in a well-ventilated area away from sparks or open flame. Gloves should be worn during use.

10. Apply solvent to sealed interface areas between roof, sidewall, and endwalls.

5-4. (cont)



11. Push roof up from endwalls to gain clearance for sling. Do not damage roof panel.

12. Slide web straps of lifting sling under roof and attach to crane or equivalent lifting device.

13. Remove fixed roof.

INSTALLATION

1. Apply sealing compound to interface areas of fixed roof with fixed endwalls.

2. Position fixed roof over shelter with crane (or equivalent lifting device) and a lifting sling with web straps.

3. Support fixed roof and remove sling straps to allow roof to be supported by upper ISO fittings at corner posts.

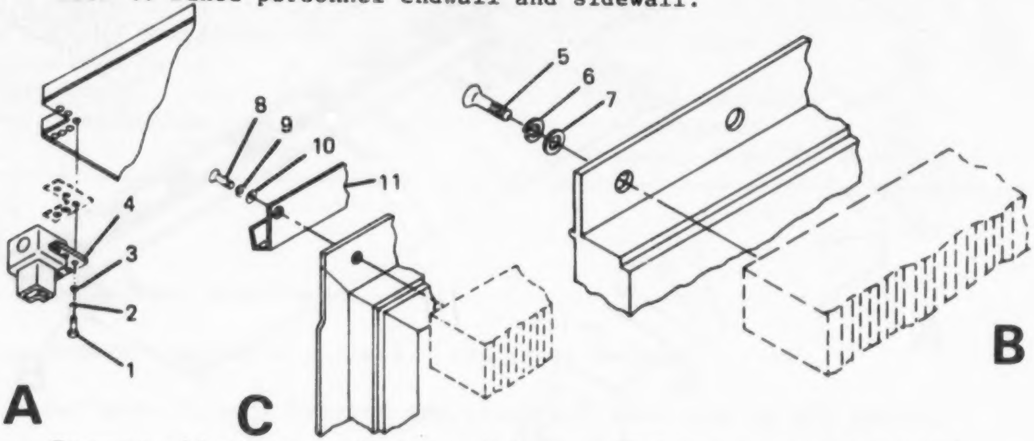
4. Align mounting holes at ISO fittings.

5-4. (cont)

5. Install bolts (1), lockwashers (2), and washers (3) securing fixed roof to upper ISO fittings (4).

6. Install bolts (8), lockwashers (9), washers (10), and drip cap (11) securing fixed roof to fixed cargo endwall.

7. Install bolts (5), lockwashers (6), and washers (7) securing fixed roof to fixed personnel endwall and sidewall.



8. Connect all wires to fixed roof beam. (Refer to paragraph 4-16)

9. Install fixed roof area ceiling lights. (Refer to paragraph 4-12)

10. Install hinged roof area ceiling lights. (Refer to paragraph 3-5)

11. Install receptacle outlets. (Refer to paragraph 4-13)

12. Set all circuit breakers to ON position.

5-5. CORNER POST AND ISO FITTING ASSEMBLY REPLACEMENT AND REPAIR

This task covers:

- a. Removal
- b. Disassembly
- c. Cleaning, Inspection
- d. Repair
- e. Assembly
- f. Installation

INITIAL SETUP

Special tools
Hand blind riveter, Appendix B, Item 2

Standard tools
General mechanics tool kit

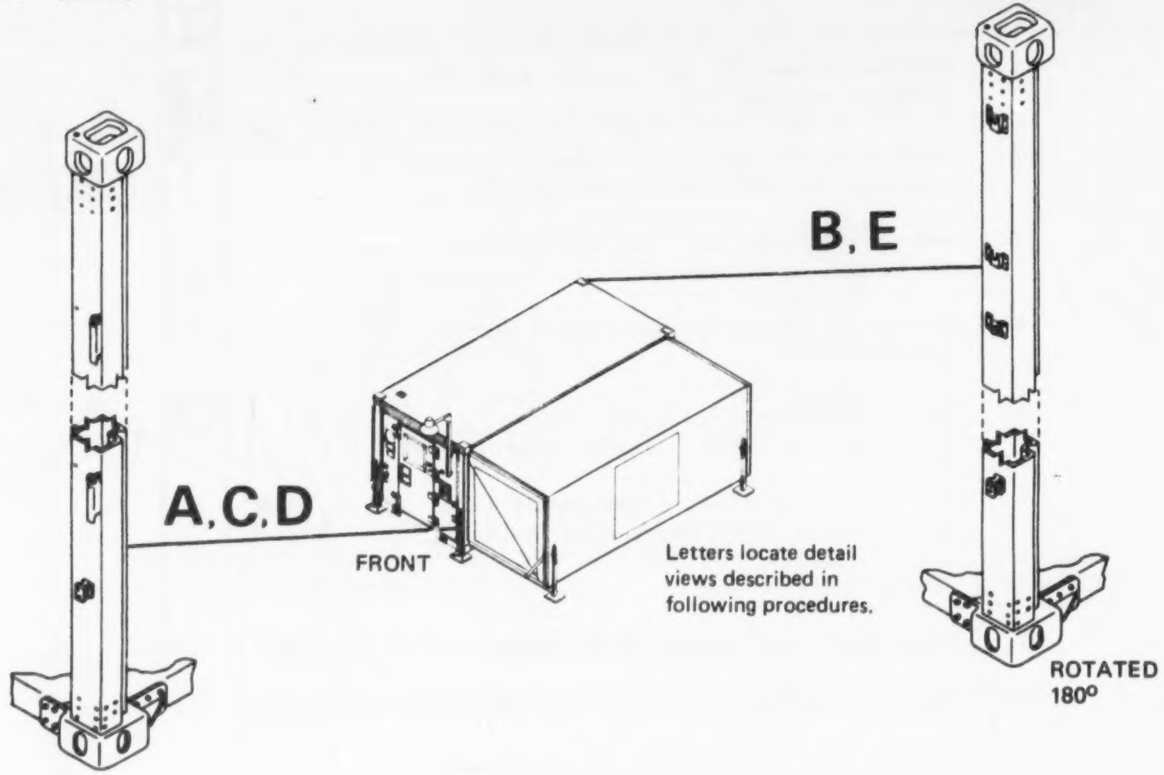
Personnel - 2

REMOVAL

NOTE

Remove shelter components as required for individual corner post replacement.

5-5. (cont)



Letters locate detail views described in following procedures.

1. Remove hinged sidewalls in accordance with paragraph 4-22.

2. Remove hinged endwalls in accordance with paragraph 4-21.

3. Remove hinged roof panels in accordance with paragraph 4-20.

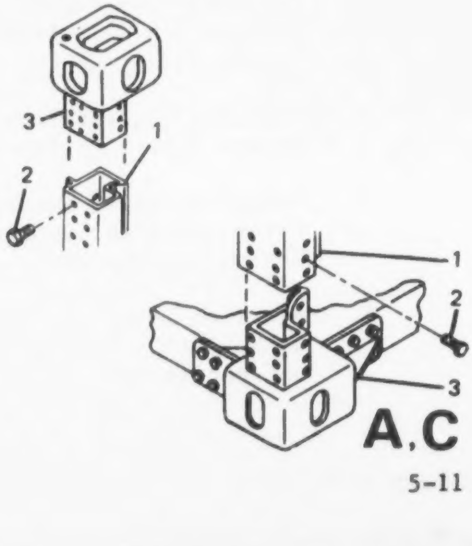
4. Remove hinged floor panels in accordance with paragraph 4-23.

5. Remove personnel door end endwall panel in accordance with paragraph 4-25.

6. Remove cargo door end endwall panel in accordance with paragraph 4-26.

7. Remove roof panel in accordance with paragraph 5-4.

8. Support corner post (1) and remove bolts (2) securing post to upper and lower ISO fittings (3).



5-5. (cont)

DISASSEMBLY

1. Remove screws (4) and remove jack support fitting (5).
2. Remove cotter pin (6), washer (7), and pin (8) and remove handle (9).
3. Remove washers (10), spring washers (11), and latch cam (12).
4. Remove screws (13) and remove roller assembly (14).
5. Drill out rivets (15) and remove light bracket (16). (Refer to paragraph 4-33)
6. Remove screws (17), lockwashers (18), and washers (19) and remove door holder (20).

CLEANING, INSPECTION

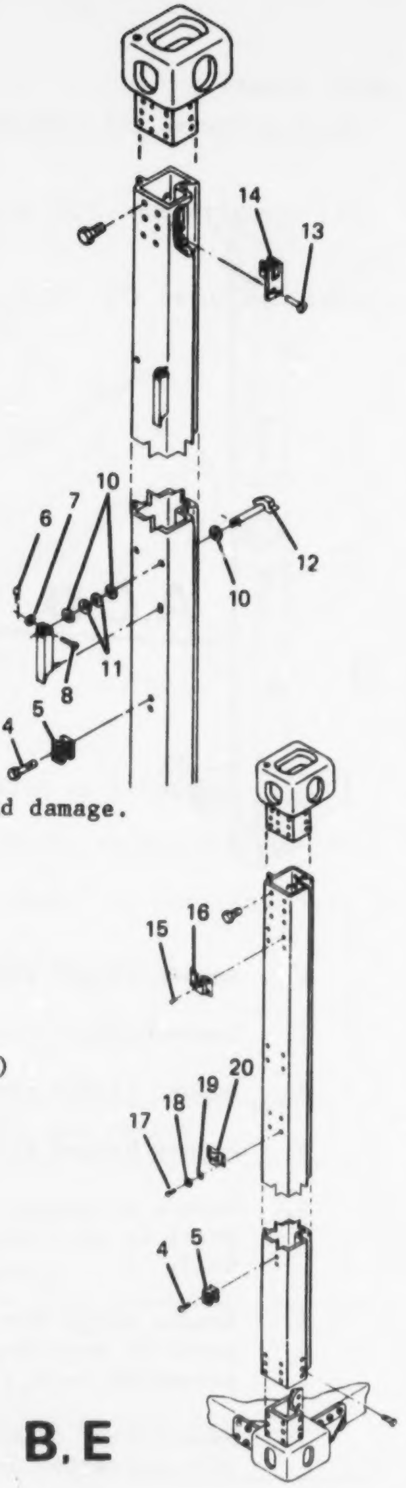
1. Clean post and component surfaces.
2. Inspect mounting surfaces for corrosion and damage.
3. Inspect for and replace if necessary.
    a. Missing or damaged components
    b. Corrosion or paint damage.

REPAIR

Corrosion or paint damage. (Refer to paragraph 4-44)

ASSEMBLY

1. Position door holder (20) and install washers (19), lockwashers (18) and screws (17).
2. Position light bracket (16) and install rivets (15). (Refer to paragraph 4-33)
3. Position roller assembly (14) against corner post and support cable and install screws (13).
4. Position latch cam (12) and install washers (10), spring washers (11), and handle (9).



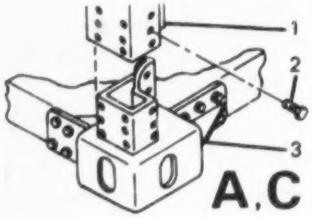
B, E

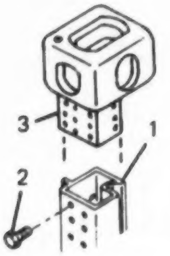
5-5. (cont)

5. Compress spring washers (11) and install pin (8), washer (7), and cotter pin (6).

6. Position jack support fitting (5) and install screws (4).

INSTALLATION





1. Position and support corner post (1) on upper and lower ISO fitting (3) and install bolts (2).

2. Install roof panel in accordance with paragraph 5-4.

3. Install cargo door end endwall panel in accordance with paragraph 4-26.

4. Install personnel door end endwall panel in accordance with paragraph 4-25.

5. Install hinged floor panels in accordance with paragraph 4-23.

6. Install hinged roof panels in accordance with paragraph 4-20.

7. Install hinged endwalls in accordance wth paragraph 4-21.

8. Remove hinged sidewalls in accordance with paragraph 4-22.

CHAPTER 6

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

6-1. GENERAL. This chapter consists of maintenance procedures for general support personnel. These procedures are limited to the floor panel replacement (paragraph 6-2).

6-2. FLOOR PANEL REPLACEMENT

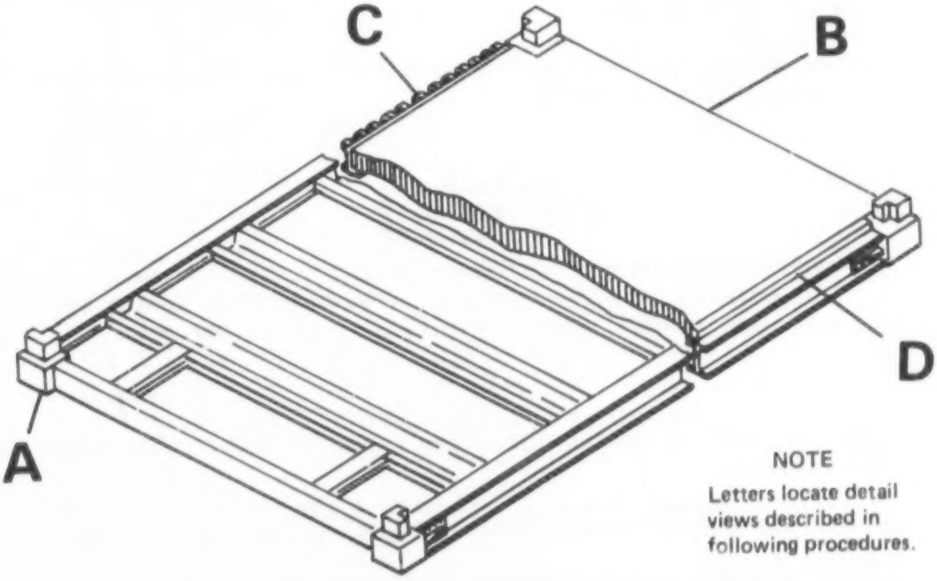
This task covers:
- a. Removal
- b. Installation

INITIAL SETUP

Special tools
  Hand blind riveter, Appendix B, Item 2
  Bottom lifting container lift sling, Appendix D
Standard Tools
  General mechanics tool kit
Personnel - 4

Personnel - 4
Materials
  Solvent, Item 20, Appendix E

REMOVAL



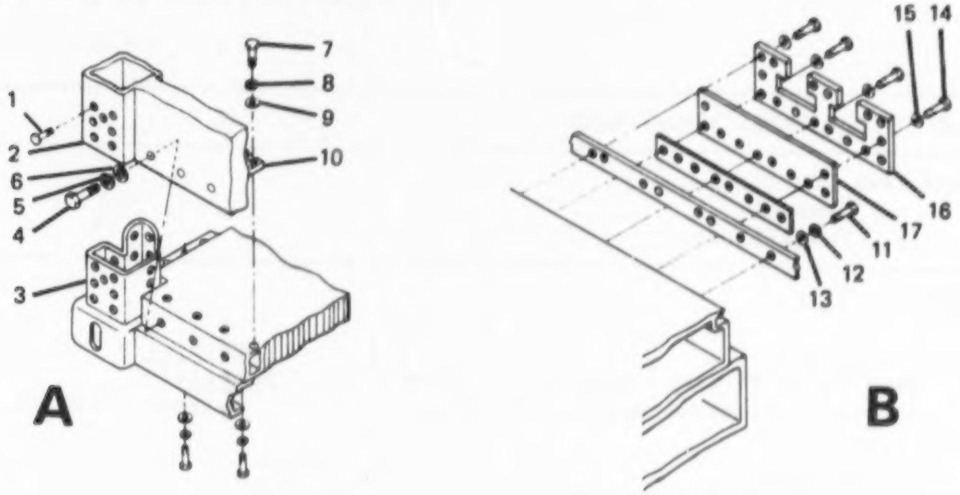
NOTE
Letters locate detail views described in following procedures.

1. Remove hinged floor in accordance with paragraph 4-23.

6-2. (cont)

2. Remove bolts (1) securing corner posts (2) to lower ISO fittings (3).

3. Remove bolts (4), lockwashers (5), and washers (6) securing fixed personnel endwall to floor.



4. Remove screws (7), lockwashers (8), and washers (9) securing reinforcement angles (10) to floor.

5. Remove bolts (11), lockwashers (12), and washers (13) securing fixed cargo endwall to floor.

6. Remove screws (14) and lockwashers (15) securing shear plate (16) and shim (17) to floor.

WARNING

Methylethylketone is flammable and toxic and shall be used in a well-ventilated area away from sparks or open flame. Gloves should be worn during use.

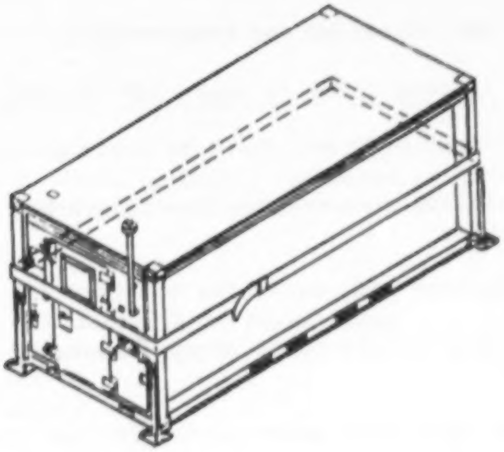
7. Apply solvent to sealed interface areas of floor with fixed sidewall and endwalls.

8. Secure web straps around shelter body.

9. Attach lifting sling to upper ISO fittings.

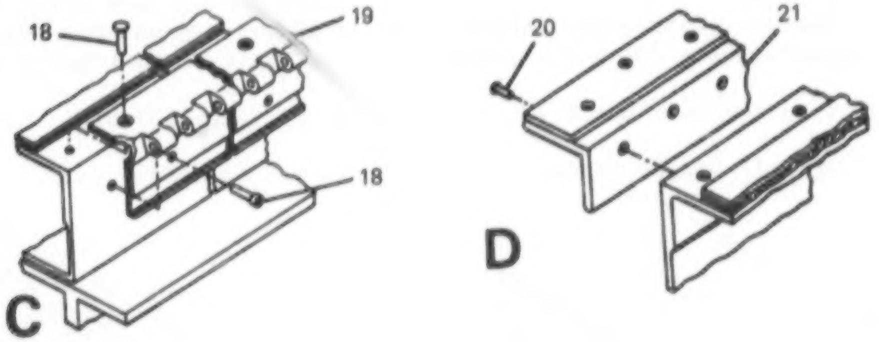
10. Lift shelter body away from fixed floor and set in level position on blocks.

6-2. (cont)



11. Drill out rivets (18) and remove hinge (19). (Refer to paragraph 4-33)

12. Drill out rivets (20) and remove support angle assembly (21). (Refer to paragraph 4-33)



INSTALLATION

NOTE

Turn floor over with base frame down.

1. Position support angle assembly (21) and install rivets (20). (Refer to paragraph 4-33)

2. Position hinge (19) and install rivets (18). (Refer to paragraph 4-33)

6-2. (cont)

3. Secure web straps around shelter body.

4. Attach lifting sling to upper ISO fitting.

5. Lift shelter body and lower to position above fixed floor.

6. Apply sealing compound to interface areas of floor and fixed endwalls.

7. Lower shelter body carefully to fixed floor.

8. Ensure that corner posts engage lower ISO fittings at all four corners.

9. Position shim (17) under plate (16) and install lockwashers (15) and screws (14).

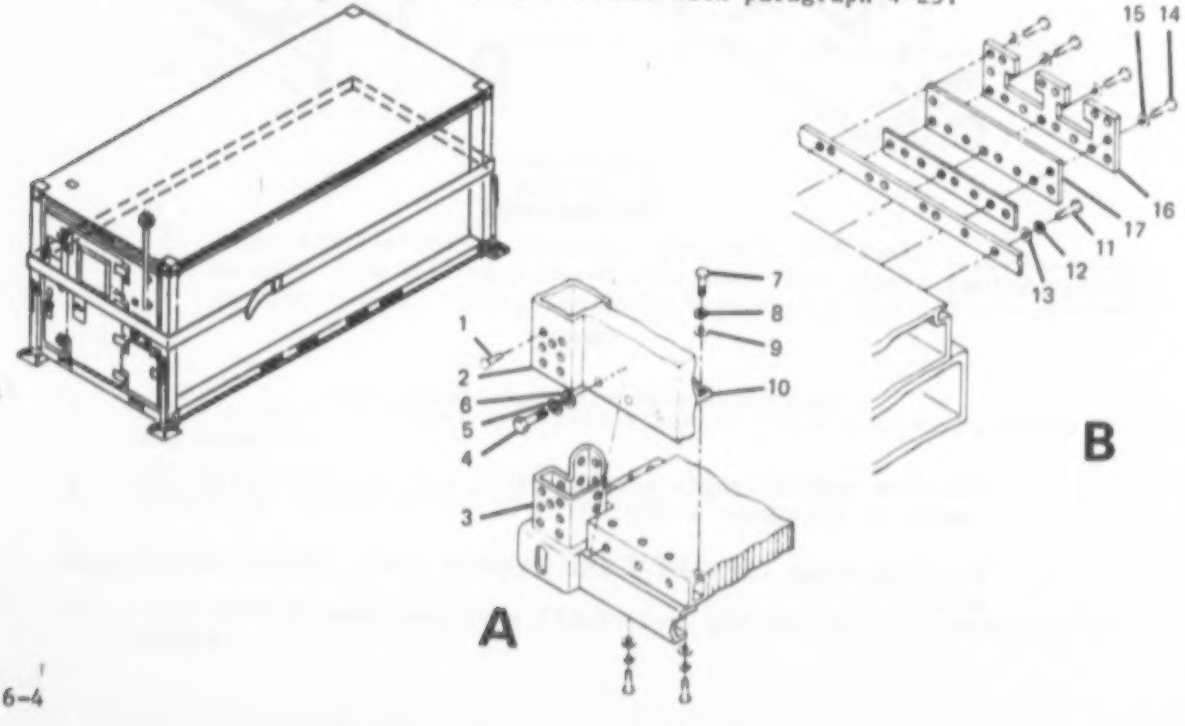
10. Secure fixed cargo endwall to floor with washers (13), lockwashers (12), and bolts (11).

11. Secure fixed personnel endwall to floor with washers (6), lockwashers (5), and bolts (4).

12. Secure reinforcement angles (10) to floor with washers (9), lockwashers (8) and screws (7).

13. Secure corner posts (2) to lower ISO fittings (3) with bolt (1).

14. Install hinged floors in accordance with paragraph 4-23.



APPENDIX A

REFERENCES

A-1. SCOPE

This appendix lists all forms, field manuals, technical manuals and miscellaneous publications referenced in this manual.

A-2. FORMS

(A)	Recommended Changes to Publications On Blank Forms	DA-2028
(F)	Reporting Errors And Improvement	AFTO-22
(A)	Quality Deficiency Report	SF-368
(A)	Packaging Improvement Report	DD-Form-6

A-3. FIELD MANUALS

(A)	Destruction Of Equipment To Prevent Enemy Use	TM 750-244-3
(F)	Inspection Manual	TO 35C2-3

A-4. TECHNICAL MANUALS

	Repair Parts And Special Tools List	TM 10-5411-200-24P
(F)	Maintenance Reporting	AFM 66-1
(A)	The Army Maintenance Management System	DA Pamphlet 738-750

APPENDIX B

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. SCOPE

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.

b. Section II designates overall responsibility for the performance of maintenance functions on the identified end item or component and the work measurement time required to perform the functions by the designated maintenance level. The implementation of the maintenance functions upon the end item or component will be consistent with the assigned maintenance functions.

c. Section III lists the tools and test equipment required for each maintenance function as referenced from Section II.

B-2. EXPLANATION OF COLUMNS IN SECTION II

a. Column 1, Group Number. Column 1 lists group numbers to identify related components, assemblies, subassemblies, and modules with their next higher assembly. The applicable groups are listed in the MAC in disassembly sequence beginning with the first group removed.

b. Column 2, Component/Assembly. This column contains the noun names of components, assemblies, subassemblies and modules for which maintenance is authorized.

c. Column 3, Maintenance Functions. This column lists the functions to be performed on the item listed in Column 2. The maintenance functions are defined as follows:

(1) Inspect. To determine serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination.

(2) Test. To verify serviceability and detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

(3) Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

(4) Adjust. To maintain within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

(5) Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

(6) Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipments used in precision measurement. Consists of comparison of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

(7) Install. The act of emplacing, seating, or fixing into position an item, part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

(8) Replace. The act of substituting a serviceable like type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

(9) Repair. The application of maintenance services (inspect, test, service, adjust, align, calibrate, or replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining, or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

(10) Overhaul. That maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (i.e., DMWR) in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to a like new condition.

(11) Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc.) considered in classifying Army equipments/components.

d. Column 4, Maintenance Category. This column is made up of subcolumns for each category of maintenance. Work time figures are listed in these subcolumns for the lowest level of maintenance authorized to perform the function listed in Column 3. These figures indicate the average active time required to perform the maintenance function at the indicated category of maintenance under typical field operating conditions.

e. Column 5, Tools and Equipment. This column is provided for referencing by code, the common tool sets (not individual tools), special tools, test and support equipment required to perform the designated function.

B-3. EXPLANATION OF COLUMNS IN SECTION III

a. Column 1, Reference Code. This column consists of an arabic number listed in sequence from Column 5 or Section II. The number references the common tool sets, special tools and test equipment requirements.

b. Column 2, Maintenance Category. This column shows the lowest category of maintenance authorized to use the special tools or test equipment.

C = OPERATOR/CREW
O = ORGANIZATIONAL
F = DIRECT SUPPORT
H = GENERAL SUPPORT
D = DEPOT

c. Column 3, Nomenclature. This column lists the name or identification of the common tool sets, special tools or test equipment.

d. Column 4, National/Nato Stock No. (NSN). This column is provided for the NSN of common tool sets, special tools and test equipment listed in the nomenclature column.

e. Column 5, Tool Number. This column lists the manufacturer's code and part number of tools and test equipment.

Section II. MAINTENANCE ALLOCATION CHART
for
SHELTER, TACTICAL, EXPANDABLE, ONE-SIDED

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
01	ELECTRICAL SYSTEM								
	Circuit Breaker Panel Assembly	Inspect	0.2						
		Test		0.2				4	
		Replace			1.0			1	
		Repair			0.5			1	
	Panel Wiring	Inspect	0.2						
		Test		0.2				4	
		Replace		0.5				1	
		Repair		0.5				1	
	Light Switches	Inspect	0.2						
		Test		0.2				4	
		Replace		0.3				1	
	Circuit Breakers	Inspect	0.2						
		Test		0.1				4	
		Replace		0.2				1	
	Power Entry Panel Assembly	Inspect	0.2						
		Test		0.2				4	
		Replace			1.0			1,2	
		Repair			0.5			1,2,12	
	Receptacles	Inspect	0.1						
		Test		0.2				4	
		Replace		0.3				1,12	
		Repair		0.3				1	
	Terminals/ Connectors	Inspect	0.2						
		Replace		0.3				1	
		Repair		0.3				1	
	Area Light Assembly	Inspect	0.1						
		Test		0.1				4	
		Replace	0.1					1	
		Repair		0.5				1,2	

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level C	O	F	H	D	(5) Tools and Equipment	(6) Remarks
	Incandescent Light Assembly	Inspect	0.1						
		Test		0.1				4	
		Replace		0.5				1	
		Repair		0.3				1	
	Ceiling Light Hinged Roof Area	Inspect	0.1						
		Test		0.1				4	
		Replace	0.2						
		Repair		0.5				1,2	
	Ceiling Light Fixed Roof Area	Inspect	0.1						
		Test		0.1				4	
		Replace		1.0				1	
		Repair		0.5				1,2	
	Receptacle Outlets	Inspect	0.1						
		Test		0.1				4	
		Replace		0.3				9	
		Repair		0.2				1	
	Switches, Wall	Inspect	0.1						
		Replace		0.3				1	
	Switch, Blackout	Inspect	0.1						
		Replace		1.5				1	
		Repair		0.5				1	
		Adjust		0.2				1	
	Wiring	Inspect	0.3						
		Test		0.3				4	
		Replace		4.0				1	
		Repair		2.0				1	
02	DOOR ASSEMBLIES								
	Door personnel and right cargo	Inspect	0.1						
		Replace		0.5				1,2	
		Repair		2.0				1	
		Align		0.2				1	
	Door Vent	Inspect	0.1						
		Replace		1.0				1	
		Repair		0.5				1,2	
		Align		0.2				1,2	

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
	Door Lock Assembly	Inspect	0.1						
		Replace		0.3				1,2	
		Repair		0.2				1	
	Door Stop Assembly	Inspect	0.1						
		Replace		0.2				1	
		Repair		0.2				1,2	
	Door, left cargo	Inspect	0.1						
		Replace		0.5				1	
		Repair		2.0				1	
		Align		0.2				1	
	Foot bolt assembly	Inspect	0.1						
		Replace		0.2				1	
		Repair		0.2				1	
		Align		0.2				1	
	Chain bolt assembly	Inspect	0.1						
		Replace		0.2				1	
		Repair		0.2				1	
03	LEVELING JACK ASSEMBLIES HINGED PANEL								
		Inspect	0.2						
		Service		0.1				5	
		Replace	0.2					1	
		Repair		0.5				1	
04	HINGED PANEL ASSEMBLIES								
	Roof Panel, hinged	Inspect	0.2						
		Service		0.2					
		Replace		1.0				1	
		Repair		2.5				1,2	
		Align		0.3				1	
	Support Strut Assemblies	Inspect	0.1						
		Replace		0.2				1	
		Repair		1.2				1	
	Endwall, hinged	Inspect	0.2						
		Replace		0.5				1	
		Repair		1.0				1,2	

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
	Closeout panel, endwall	Inspect	0.2						
		Replace	0.3					1	
		Repair		1.0				1	
	Latches	Inspect	0.1						
		Replace		2.0				1	
		Repair		1.0				1	
	Sidewall, hinged	Inspect	0.2						
		Replace		0.5				1	
		Repair		1.5				1,2	
	Closeout panels, sidewall	Inspect	0.2						
		Replace	0.3					1	
		Repair		1.0				1,2,10	
	ECU intake panel	Inspect	0.1						
		Replace	0.1					1	
		Repair		0.5				1,2,3	
	ECU return panel	Inspect	0.1						
		Replace	0.1					1	
		Repair		0.5				1,3	
	Floor panel, hinged	Inspect	0.5						
		Replace		3.0				1	
		Repair		2.0				1,2	
05	CONTAINER LIFT JACK ASSEMBLIES	Inspect	0.2						
		Service		0.1				5	
		Replace	0.2					1	
		Repair		0.5				1	
06	FIXED PANEL ASSEMBLIES								
	Endwall panel, personnel door end	Inspect	0.2						
		Replace		4.0				1	
		Repair		2.0				1,2	
	Level Assembly	Inspect	0.1						
		Replace		0.5				2	
		Repair		0.4				1	
	Step, folding	Inspect	0.1						
		Replace		0.2				1	
		Repair		0.2				1	

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
	Endwall panel, cargo door end	Inspect	0.2						
		Replace		3.0				1	
		Repair		2.0				1,2	
	Sidewall panel	Inspect	0.3						
		Replace		4.0					
		Repair		3.0					
	Roof Panel	Inspect	0.3						
		Replace			6.0			1,6,7	
		Repair		3.0				1,2	
	Load balancer and cable assembly	Inspect	0.2						
		Replace		0.5				1	
	Stowage brackets	Inspect	0.1						
		Replace		0.2				1	
		Repair		0.2				1	
	Solar bar assembly	Inspect	0.2						
		Replace		2.0				1	
		Repair		1.0				1	
	Floor panel	Inspect	0.2						
		Replace				12.0		1,2,7,8	
		Repair		3.0				1,13,14	
07	FRAME ASSEMBLY								
	Corner post and ISO fitting assembly	Inspect	0.2						
		Replace			14.0			1,2	
		Repair			1.5			1,2	
	Handle, camlock and latch cam	Inspect	0.2						
		Replace		0.3				1	
		Repair		0.3				1	
08	MISCELLANEOUS COMPONENTS								
	Equipment container	Inspect	0.2						
		Replace		0.2				1	
		Repair		0.5					
	Storm configuration components	Inspect	0.1						
		Replace	0.2					1	
	Support braces	Inspect	0.1						
		Replace	0.1					1	
	Leveling jack extensions	Inspect	0.2						
		Replace	0.2					1	

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS

SHELTER, TACTICAL, EXPANDABLE, ONE-SIDED

(1) REFERENCE CODE	(2) MAINTENANCE CATEGORY	(3) NOMENCLATURE	(4) NATIONAL STOCK NUMBER (NSN)	(5) TOOL NUMBER
1	C, O, F, H	Tool Kit, General Mechanics	5180-00-177-7033	
2	O, F, H	Riveter, Blind, Hand	5120-00-017-2849	
3	C	Installation tool		FSCM 08524 FRB703-12
4	O	Multimeter	6625-00-999-6282	
5	O	Tool Kit, Electrical	5180-00-876-9336	
6	O	Drill, Electric, Portable 1/4 inch cap	5130-00-204-2778	
7	O	Fastener Header (10-32, 1/4-28)		FSCM 03481 C845
8	O	Fastener Header (5/16-24, 3/8-24)		FSCM 03481 C-722
9	O	Installation Tool		FSCM 94222 29-47-102-10
10	O	Snap Ring Pliers	5120-00-789-0492	
11	O	Wrench, Box End or Adjustable		
12	O	Crimping Tool		FSCM 56501 TBM5
13	O	Took Kit, Blind Bolt Removal		FSCM 17446 105-60
14	O	Installation Tool		FSCM 17446 115
15	O	Router, Electric, Portable	5130-00-990-4449	
16	O	Heat Lamp, Tripod Base		FSCM 39428 8439K11

APPENDIX C

COMPONENTS OF THE END ITEM LIST

Section I. INTRODUCTION

C-1. SCOPE

This appendix lists components of end item for the shelter to help you inventory items required for safe and efficient operation.

C-2. GENERAL

The Components of End Item List is provided in Section II. This listing is for informational purposes only, and is not authority to requisition replacements. These items are part of the end item, but are removed and separately packaged for transportation or shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Illustrations are furnished to assist you in identifying the items.

C-3. EXPLANATION OF COLUMNS IN SECTION II

The following provides an explanation of columns found in the tabular listings:

a. Column (1) - Illustration Number (Illus Number). This column indicates the number of the illustration in which the item is shown.

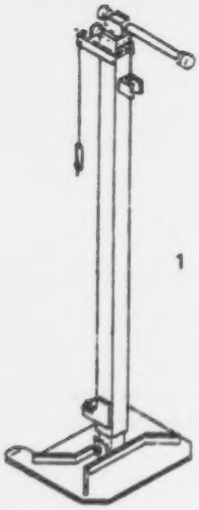
b. Column (2) - National Stock Number. Indicates the National stock number assigned to the item and will be used for requisitioning purposes.

c. Column (3) - Description. Indicates the Federal item name and, if required, a minimum description to identify and locate the item. The last line for each item indicates the FSCM (in parentheses) followed by the part number.

d. Column (4) - Unit of Measure (U/M). Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr).

e. Column (5) - Quantity required (Qty rqr). Indicates the quantity of the item authorized to be used with/on the equipment.

Section II. COMPONENTS OF END ITEM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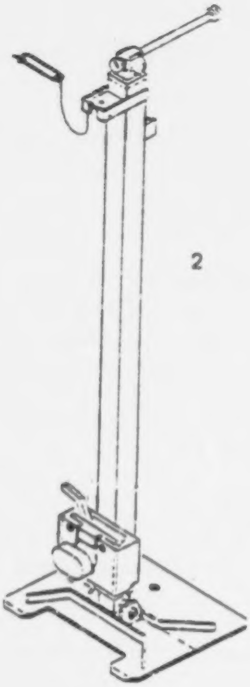
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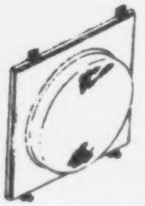
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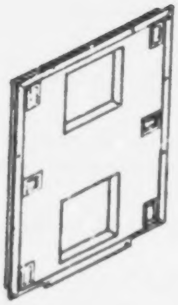
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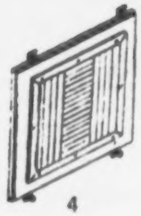
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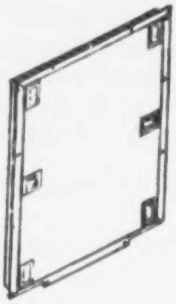
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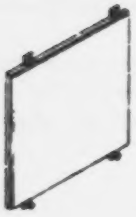
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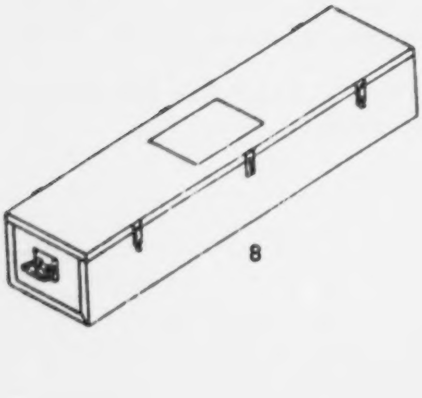
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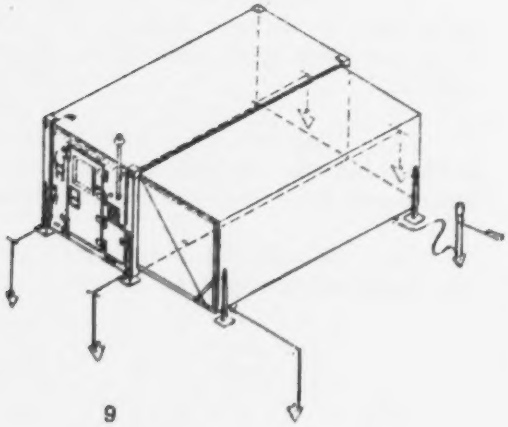
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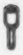
Section II. COMPONENTS OF END ITEM (cont)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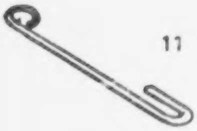
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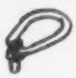
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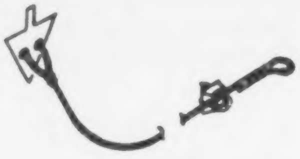
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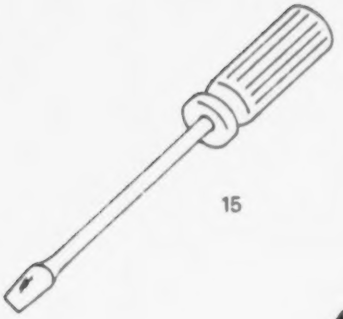
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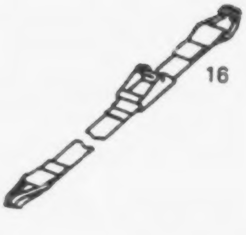
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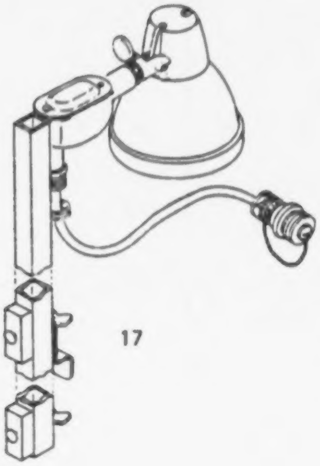
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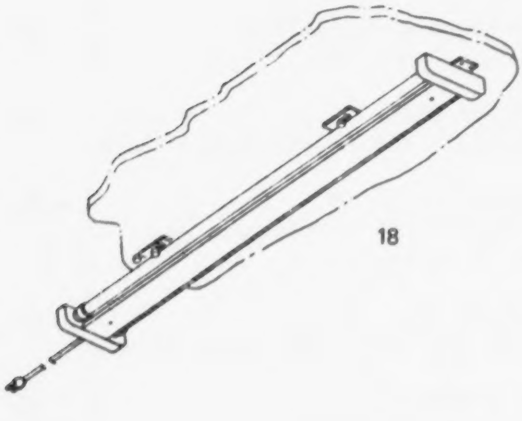
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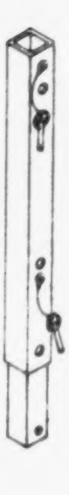
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Section II. COMPONENTS OF END ITEM (cont)

(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty rqr
1		JACK ASSEMBLY, HINGED (81377) 5-4-2887-1	EA	2
2		JACK ASSEMBLY, INTERNATIONAL STANDARD FITTING (81377) 5-4-2866-1	EA	4
3		PANEL ASSEMBLY ECU RETURN (81377) 5-4-2857-1	EA	1
4		PANEL ASSEMBLY, ECU INTAKE (81377) 5-4-2856-1	EA	1
5		CLOSEOUT PANEL ASSEMBLY WITH ECU OPENINGS (81377) 5-4-4657	EA	1
6		CLOSEOUT PANEL ASSEMBLY 58.5 x 77.0 (81377) 5-4-4790	EA	3
7		CLOSEOUT PANEL ASSEMBLY 21 x 21 (81377) 5-4-2853-1	EA	2
8		EQUIPMENT CONTAINER WITH CONTENTS (81377) 5-4-5097	EA	1
9		TIEDOWN INSTALLATION (81337) 5-4-4712	EA	1
10		DRIVE HEAD (81349) MIL-A-3962 size 4 inch	EA	1
11		HOLDING HANDLE (81349) MIL-A-3962 size 4,6, or 8 inch	EA	1
12		DRIVE ROD (81349) MIL-A-3962 size 4 inch	EA	1
13		TIEDOWN RING (81337) 5-4-3020	EA	2

Section II. COMPONENTS OF END ITEM (cont)

(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty rqr
14		GROUND ANCHOR ASSEMBLY (81337) 5-4-2981	EA	6
15		SCREWDRIVER (81349) GGG-S-121 class 5 design A	EA	1
16		STRAP ASSEMBLY, TIEDOWN (81337) 5-4-4944	EA	2
17		LIGHT ASSEMBLY, EXTERIOR (81337) 5-4-2974	EA	1
18		LIGHT ASSEMBLY, REMOVABLE (81337) 5-4-4679	EA	3
19		EXTENSION ASSEMBLY, JACK (81337) 5-4-2893-1	EA	2

APPENDIX D

ADDITIONAL AUTHORIZATION LIST

Section I. INTRODUCTION

D-1. SCOPE

This appendix lists additional items you are authorized for the support of the shelter.

D-2. GENERAL

This list identifies items that do not have to accompany the shelter and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TDA, or JTA.

D-3. EXPLANATION OF LISTING

National stock numbers, descriptions, and quantities are provided to help you identify and request the additional items you require to support this equipment. The items are listed in alphabetical sequence by item name under the type document (i.e., CTA, MTOE, TDA, or JTA) which authorizes the item(s) to you.

Section II. ADDITIONAL AUTHORIZATION LIST

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION FSCM & PART NUMBER	(3) U/M	(4) QTY AUTH
	CONTAINER LIFT SLING, bottom lifting (65059) 74016B-20	EA	1
	CONTAINER LIFT SLING, top lifting (65059) 74016T-1A	EA	1
5120-01-013-1676	GROUND ROD ASSEMBLY	EA	1
5120-00-293-0887	SLEDGE HAMMER, 12 pound	EA	1
5979-00-878-3791	SLIDE HAMMER, ground	EA	1

APPENDIX E

EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

E-1. SCOPE

Section II of this appendix lists expendable supplies and materials you will need to operate and maintain the shelter. These items are authorized to you by CTA 50-970, Expendable Items.

E-2. EXPLANATION OF COLUMNS IN SECTION II

a. Column 1, Item Number. This number is assigned to the entry and is referenced in the narrative instructions to identify the material.

b. Column 2, Level. This column identifies the lowest level of maintenance that requires the listed item.

C - Operator/Crew
O - Organizational Maintenance
F - Direct Support Maintenance
H - General Support Maintenance

c. Column 3, National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.

d. Column 4, Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the Federal Supply Code for Manufacturer (FSCM) in parenthesis followed by the part number.

e. Column 5, Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Section II. EXPENDABLE MATERIALS AND SUPPIES LIST

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
1			Adhesive (FE6026)	
2			Adhesive, Silicon	
3			Adhesive, Silicon	
4			Aluminum patch 0.040 in. thick x 12 x 12 in. (1.02 mm x 30.48 x 30.48 cm)	
5			Cloth, Cotton	
6			Coating system, epoxy-polymide (MIL-C-22751)	
7			Core, 3 in. thick x 12 x 12 ±1 (76.2 mm x 30.48 x 30.48 ±2.54 cm)	
8			Core, 2 1/2 in. thick x 12 x 12 ±1 (63.5 mm x 30.48 x 30.48 ±2.54 cm)	
9			Core, 2 in. thick x 12 x 12 ±1 (50.8 mm x 30.48 x 30.48 ±2.54 cm)	
10			Core, 1 1/2 in. thick x 12 x 12 ±1 (38.1 mm x 30.48 x 30.48 ±2.54 cm)	
11			Gloves, White	
12			Grease, Automotive (MIL-G-10924)	
13			Rivet, Blind 3/16 dia. 3/16 - 7/16 grip (1601-0619 Avdell Corp.)	
14			Rivet, Blind 3/16 dia. 1/16 - 1/4 grip (1601-0613 Avdell Corp.)	
15			Rivet, Blind 1/8 dia. 1/8 - 5/16 grip (1601-0414 Avdell Corp.)	
16			Rivet, Blind 1/8 dia. 1/32 - 3/16 grip (1601-0410 Avdell Corp.)	
17			Sandpaper	
18			Sealant (MIL-S-22473)	
19			Sealing compound (PR1422) (MIL-S-8802)	
20			Solvent, Methylethylketone	
21			Stick, Mixing	
22			Tape, Masking 1 in. wide (2.54 cm) (3M)	
23			Grease. Silicone (Dow Corning 111 compound)	
24			Aluminum Plate 1/8 in. thick X 2 in. square (3.2 min x 50.8 max)	
25			Lubricant, Spray	

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By Order of the Secretaries of the Army and the Air Force:

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COA, 3d ENGINEER BN
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BE EXACT. PIN-POINT WHERE IT IS

PAGE NO.	PARA-GRAPH	FIGURE NO	TABLE NO	IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
6	2-1 a			In line 6 of paragraph 2-1a the manual states the engine has 6 Cylinders. The engine on my set only has 4 Cylinders. Change the manual to show 4 Cylinders.
B1		4-3		Callout 16 on figure 4-3 is pointing at a bolt. In key to figure 4-3, item 16 is called a shim - Please Correct one or the Other.
125	line	20		I ordered a gasket, item 19 on figure B-16 by NSN 2910-00--762-3001. I got a gasket but it doesn't fit. Supply says I got What I ordered, so the NSN is Wrong. Please give me a good NSN

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER JOHN DOE, PFC (268) 317-7111	SIGN HERE John Doe JOHN DOE

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The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton-meters	.11296			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C